Trempealeau

National Wildlife Refuge

Comprehensive Conservation Plan

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Chapter 1: Introduction, Purpose and Need, and Issues

Introduction

This document is a Comprehensive Conservation Plan (CCP) for Trempealeau National Wildlife Refuge (NWR or Refuge). It follows the basic and accepted format for a CCP and stems from an Environmental Impact Statement (EIS) that was completed in 2008.

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.

Refuge History and Purpose

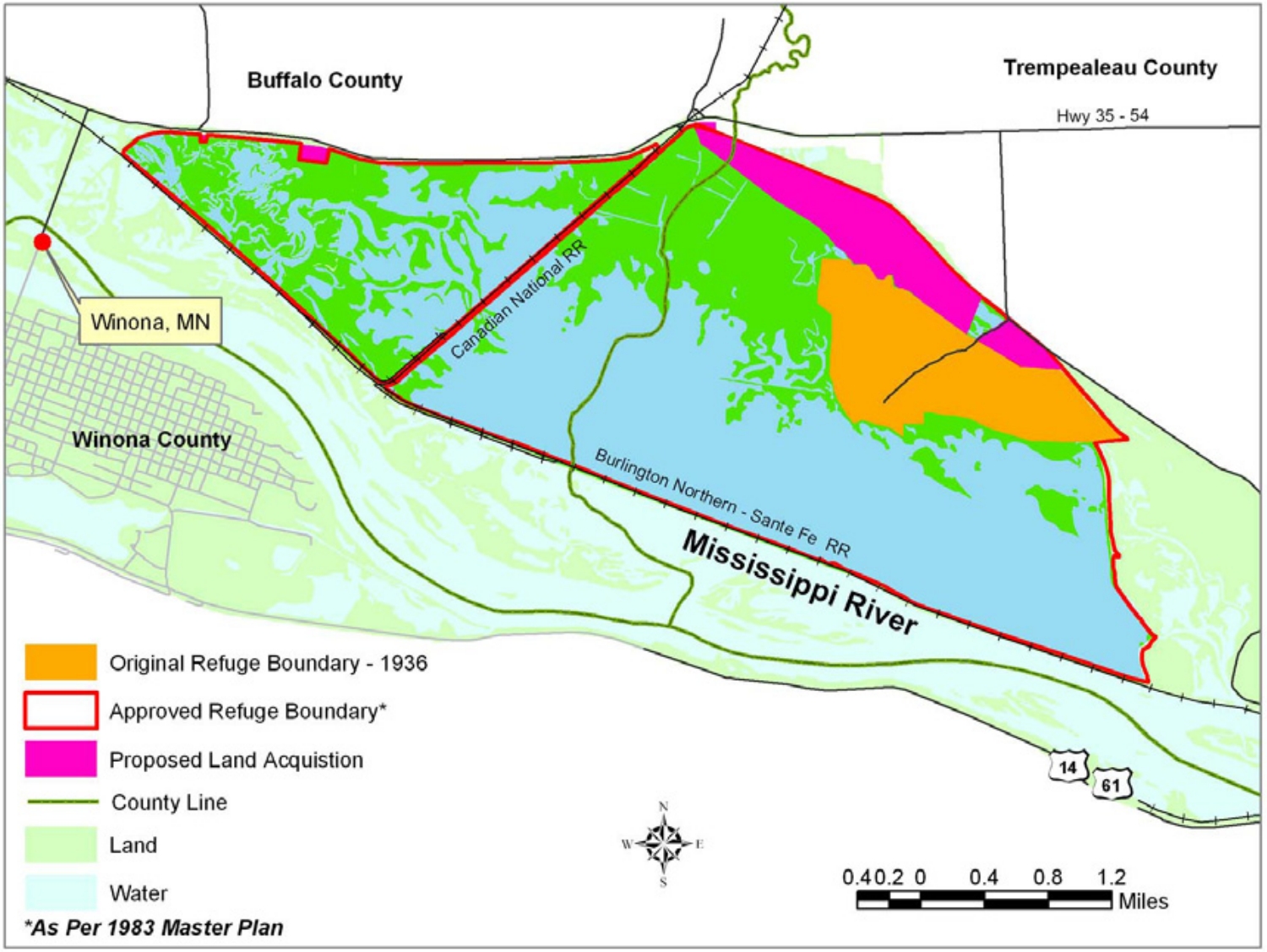
In the late 1800s a railroad was constructed along the Mississippi River. Today it forms the Refuge's south boundary. In the early 1900s, a drainage district was formed with the intent of draining the area north of the railroad dike for farming. The district dug a channel diverting the Trempealeau River 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 dikes became part of a corporation known as Delta Fish and Fur Farm (Delta FFF).

Northern Shoveler Hen / USFWS

Trempealeau NWR was established in 1936 when 706.9 acres were set aside by Executive Order 7437 (Appendix E) (Figure 2 on page 3). The original Refuge consisted of an upland portion with open areas

Figure 1: Location of Trempealeau NWR in Wisconsin

Figure 2: Trempealeau NWR Boundary



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 Need II on page 5. These purposes remain valid to this day and guide the planning management, administration, and use of the Refuge.

American Coot, USFWS

Refuge Vision

The vision for Trempealeau NWR is:

> "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."

Purpose and Need for the Plan

Purpose

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 Need I on page 5). The CCP helps describe a desired future condition of the Refuge, and provides both long-term and day-to-day 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 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 affect-

ing 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.

The EIS documents met those requirements and provided the necessary information and analysis to the decision-maker.

Finally, the planning process was 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.

Need

This 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 needs. These needs are summarized in the following paragraphs. More detail on issues related to these needs can be found in Chapter 2.

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 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 F)
>
> "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
>
> "...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.)

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.

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."

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.

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 E.

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.

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).

Public Use Natural Area Policy

The Refuge currently has one Public Use Natural Area, the Black Oak Island Public Use Natural Area. (See "Black Oak Island Natural Area" on page 48). 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.

Chapter 2: Public Involvement and Decision Process

Introduction

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.

Issues Identified in Scoping

Issues, which are often synonymous with concerns and opportunities, were identified through the scoping and public involvement process. The issues below represent input from the public, other agencies and organizations, and Refuge managers and staff as well as the mandates and guidance.

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 4, they create a meaningful plan of action to help meet the mission of the Refuge System and the purposes and goals of the Refuge.

Tundra Swan. USFWS

Goal 1: Landscape

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.

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.

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.

Natural Areas and Special Designations

In 1986, Black Oak Island (***see*** Figure 8 on page 38) 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 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.

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.

A volunteer pulling buckthorn. Trempealeau NWR

Goal 2: Wildlife and Habitat Issues

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.

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.

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

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 3). 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.

Water Level Management

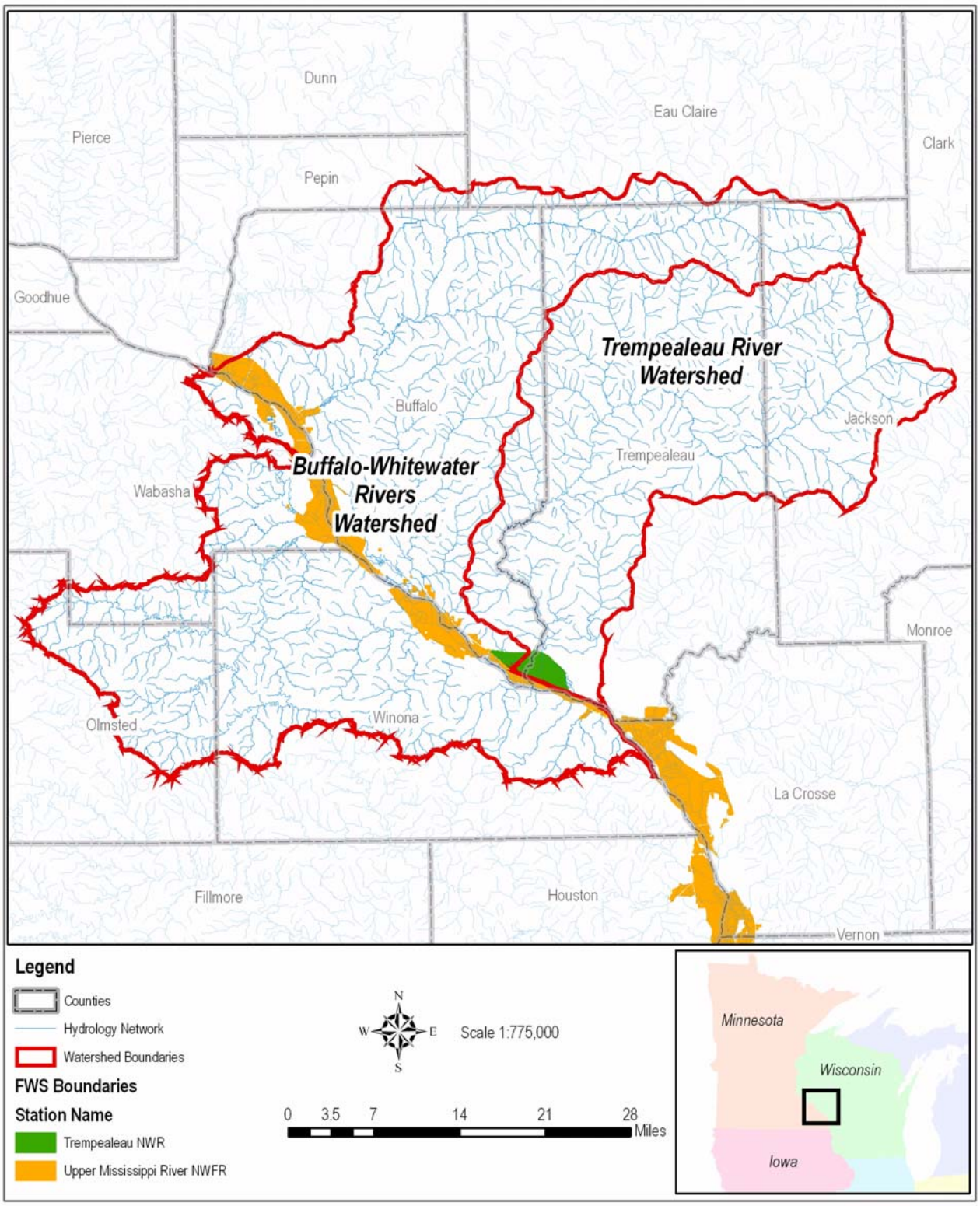
The Refuge was once a backwater of the Mississippi River, but was essentially isolated in the early 1900s by the construction of the Burlington Northern Sante Fe Railroad dike and the diversion of the Trempealeau River. The hydrology was further altered in the 1930s by the construction of Lock and Dam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

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

Figure 3: Watershed of the Trempealeau and Buffalo Rivers



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.

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.

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.

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 forest 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, 2008).

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.

Prescribed burning, Trempealeau NWR. USFWS

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 commercial 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.

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.

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 1 on page 36).

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.

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.

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 immerging 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).

Goal 3: Public Use Issues

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 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 is does encourage the agency to review potential sites. Service guidance will be forthcoming.

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.

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.

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.

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

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.

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.

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.

Northern pike. USFWS

Non-Refuge Sponsored Events

Boy Scout jamborees, over night camping by school groups, weddings, family reunions, and fundraising 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.

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.

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.

Goal 4: Neighboring Landowner and Community Issues

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 Ref-

uge 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.

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.

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.

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 control 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.

Canada Goose banding program at Trempealeau NWR. USFWS

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.

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.

Goal 5: Administration and Operations Issues

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 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.

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.

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.

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.

Review of the Draft EIS/CCP

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 nongovernment 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.

Final EIS/CCP and Record of Decision

Following the publication of the Final EIS/CCP in May 2008, the Regional Director, U.S. Fish and Wildlife Service, Twin Cities, Minnesota, determined which alternative evaluated in the Final EIS would become the Final CCP. This decision has been recorded in a formal Record of Decision (Appendix A). Substantive comments from the public, agencies, and other groups that were received on the Draft EIS/CCP were included in the Final EIS, along with a Service response.

The Final EIS/CCP was distributed to local libraries and persons who requested the full document. The document was also posted on the Region's planning website. A Notice of Availability of the Final EIS/CCP was published in the Federal Register by the Environmental Protection Agency on April 25, 2008.

One comment, which restated concerns that had been expressed in the Draft EIS comment period and had been responded to in the Final EIS, was received during the 30 days following publication of the Notice of Availability in the Federal Register.

The Regional Director signed a Record of Decision on June 17, 2008.

Chapter 3: Affected Environment

Ecosystem Setting

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 4). 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 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.

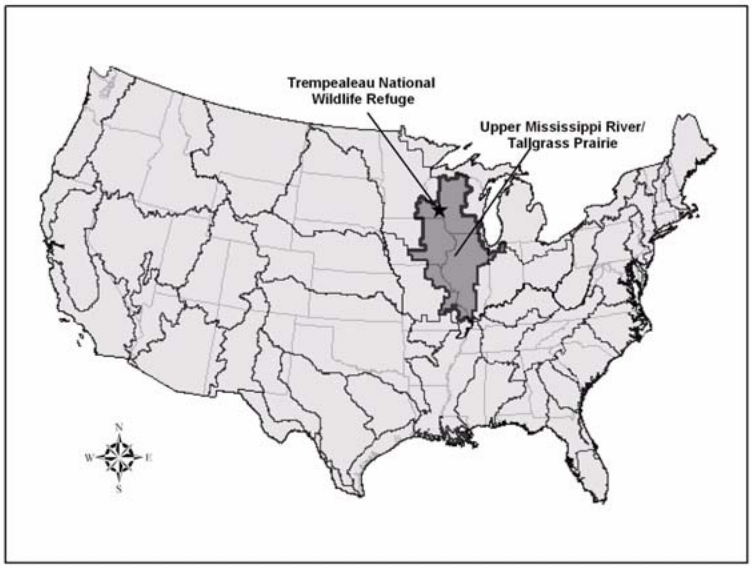
Raccoon in a tree along Refuge Road, Trempealeau NWR. USFWS

Physical Environment

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 4: 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.

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 5.

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 sensitive 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 6 on page 24). 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

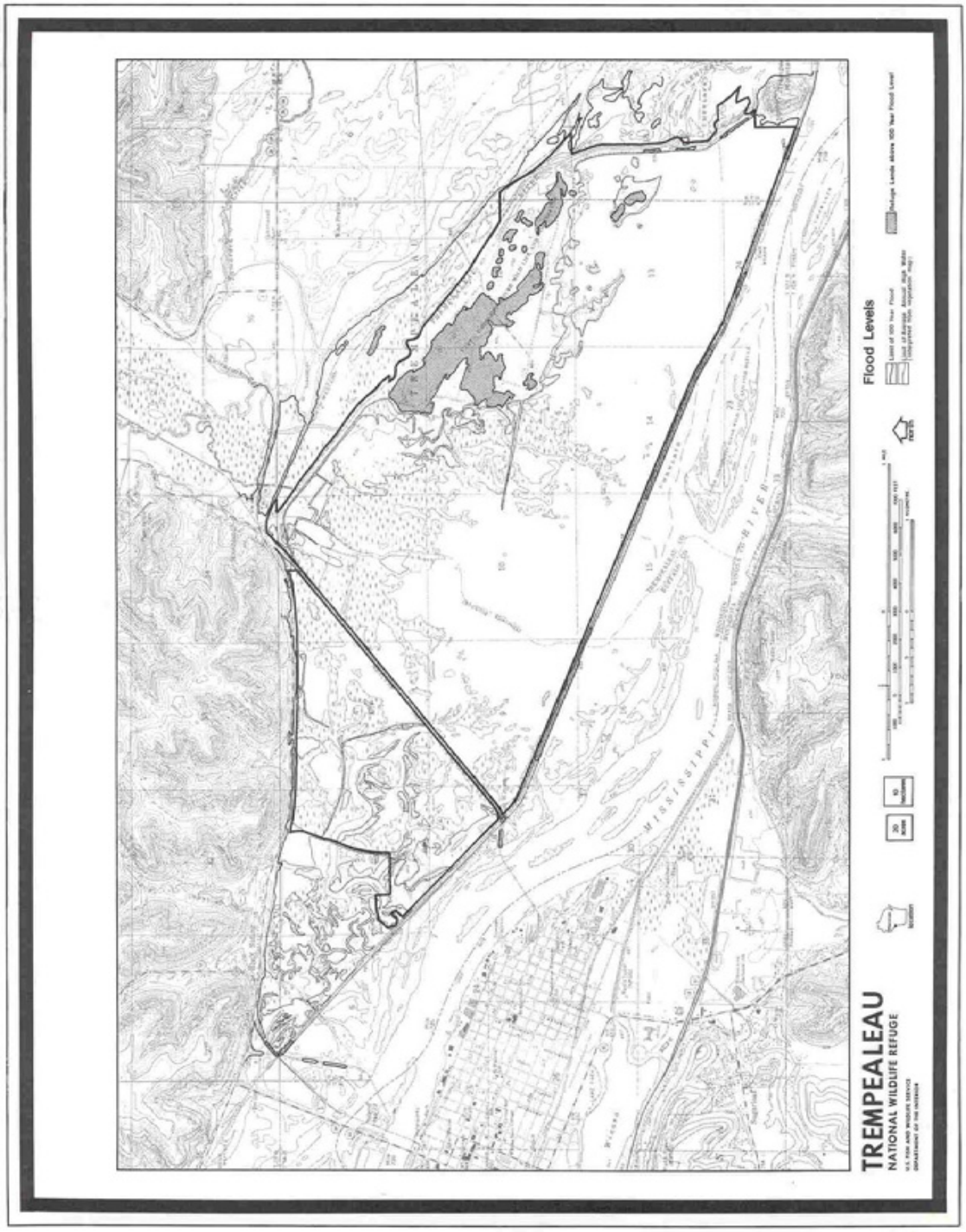
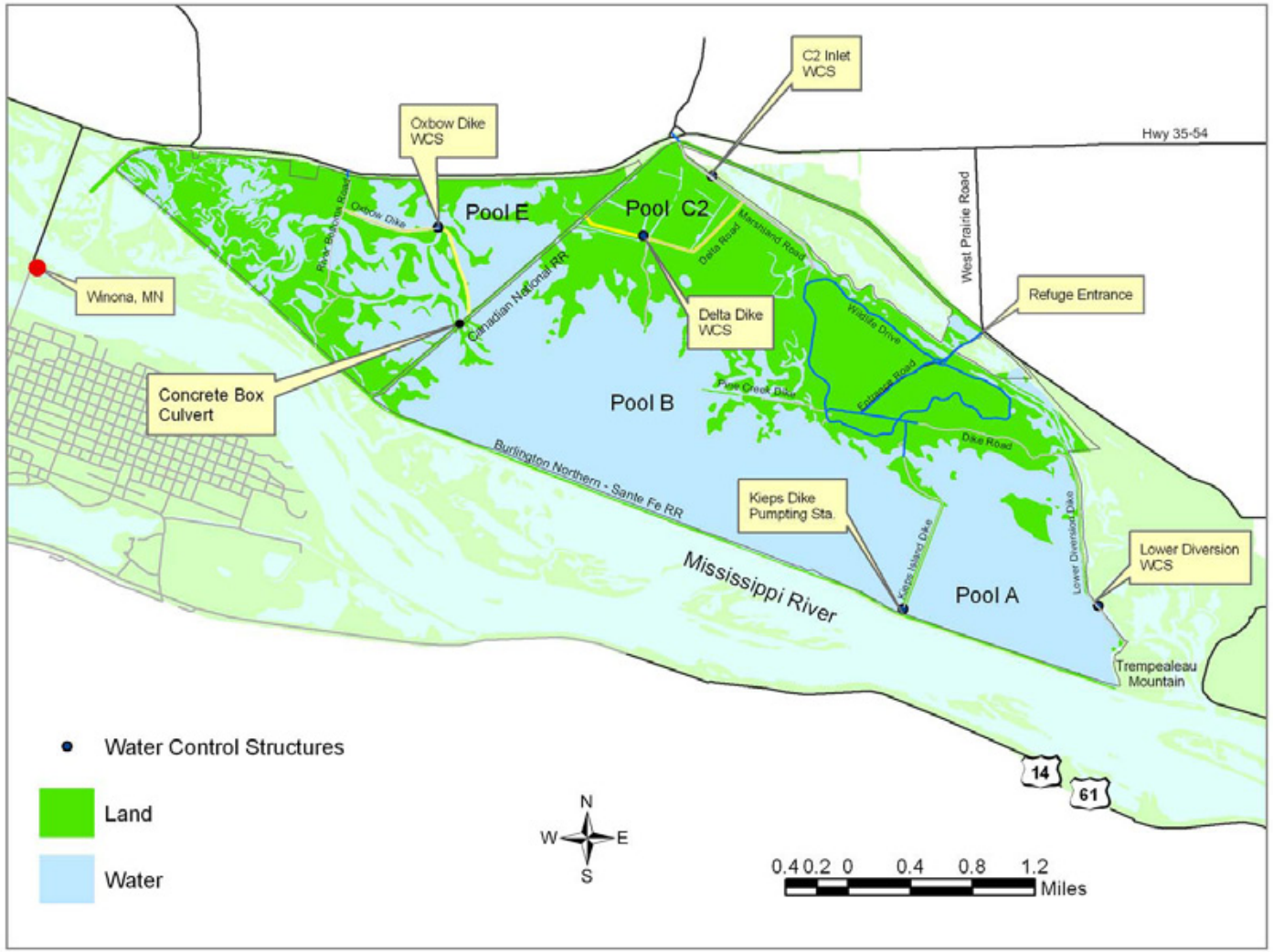


Figure 5: Portion of Trempealeau NWR Above the 100-Year Flood Elevation (1965)

Figure 6: 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.

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 overlie 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.

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.

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. Phytoplantkon 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.

Vegetation and Habitat Resources

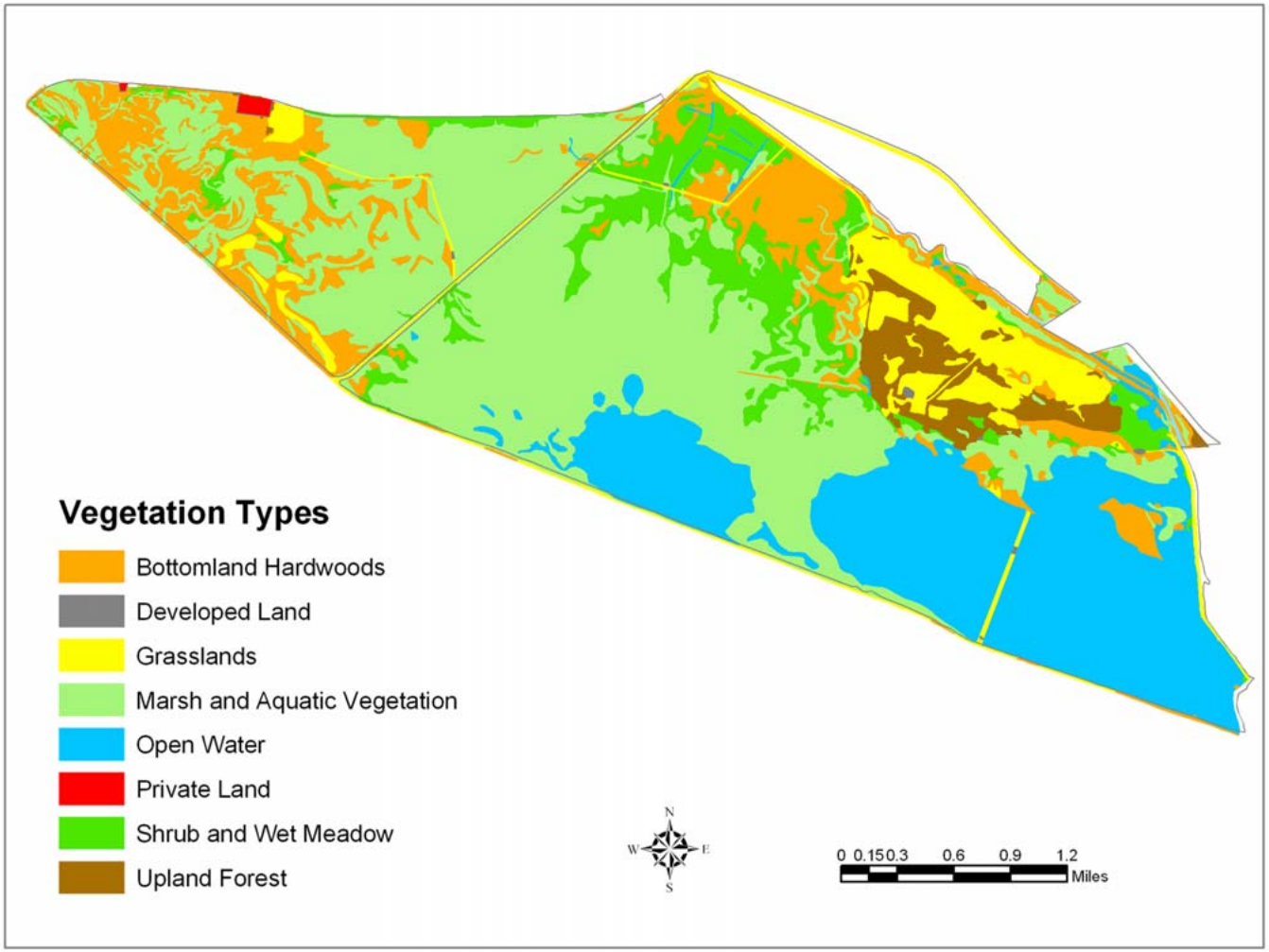
Habitats and Vegetation Types

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

Figure 7: 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

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 bromegrass and bluegrass occur throughout the grasslands. Leafy spurge began invading grasslands 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, 2008).

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.

Fisheries Habitats and Resources

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 C).

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

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.

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 rookery 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.

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.

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.

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. Bighead 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 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 bighead carp do not enter Trempealeau NWR from the Trempealeau River when the gates are open and water is being discharged.

Red fox. USFWS

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.

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).

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 dab-

bling 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 C). 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.

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.

Refuge and Wisconsin DNR staff and volunteers round up flightless geese for banding on the Refuge. July 2002. USFWS

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.

Waterbirds

Pelicans and Cormorants

White Pelicans began appearing on Trempealeau NWR and vicinity in the mid-1980s. Since then numbers 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

American White Pelicans. © Sandra Lines

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.

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 rookery 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.

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.

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 C).

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.

Raptors

Bald Eagle (see Section on page 35) 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.

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.

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 C).

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 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

Leopard frog. © Sandra Lines

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.

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 C). 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.

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.

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.

Federally Endangered and Threatened Wildlife Species

The Bald Eagle was recently removed from the federal threatened and endangerd 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 Refeuge 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.

State Listed Species

Table 1 lists vertebrate species receiving special designation as Endangered, Threatened, or Special Concern Species pursuant to the Wisconsin Endangered Species Act.

Special Uses

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.

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.

Table 1: 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	

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 8.

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 8).

A third Refuge access point is from Highway 35 via a parking area at the north end of River Bottoms Road (Figure 8). 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

River Education Days at Trempealeau NWR. USFWS

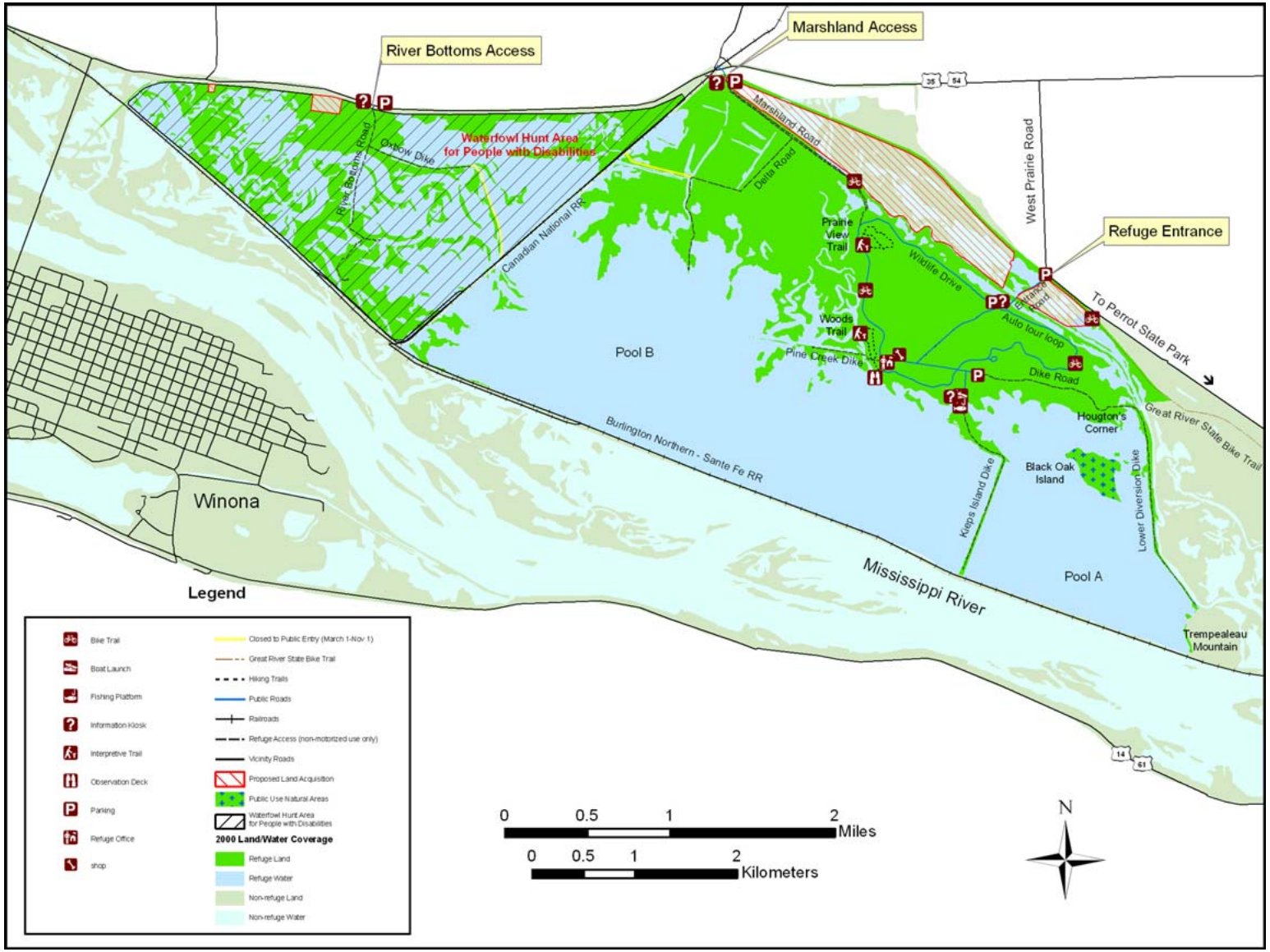
Recreation

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 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

Figure 8: Current Public Use, Trempealeau NWR



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 24).

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 24) 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. Opportunities 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.

Songbird banding for a Girl Scout program at Trempealeau NWR. USFWS

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 (CNRR) 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 24). 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.

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 temperature. 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

Bicycling on the Great River State Trail generates more than one-fourth of all public visits to the Refuge. USFWS

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.

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.

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.

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)

Native American Cultural History and Landscape

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 at 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.

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.

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 onsite museum property such as archeological collections, artwork, historical documents, or natural history collections.

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.

Existing Facilities and Infrastructure

Major facilities on the Refuge are shown in Figure 9 and described below.

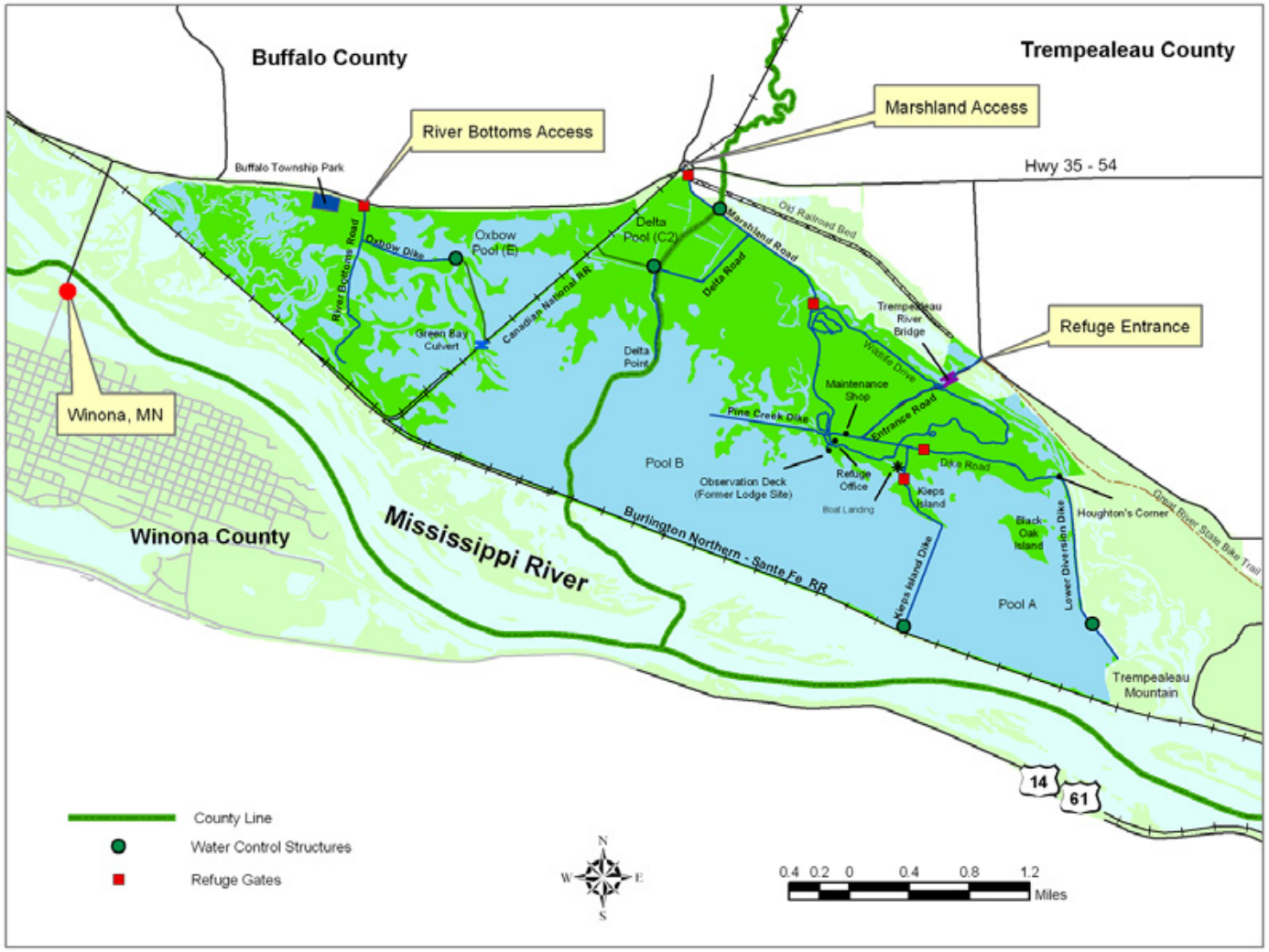
Buildings. The existing Refuge office building was constructed in 1998 on a site above the 100-year flood elevation. It includes a visitor contact and display area, offices for five Refuge staff, a conference room and restrooms. The former headquarters building is now used as a shop and office for maintenance 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 9).

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 9). Marshland Dike spans about 1 mile from the wildlife drive to the Marshland access. Both dikes were originally constructed 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 6 on page 24).

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

Figure 9: Facilities and Structures, Trempealeau NWR



Bush chipping and clearing dikes at Trempealeau NWR. USFWS

pool inlet structure, and the E Pool WCS and portable pump station (Figure 6 on page 24).

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 6 on page 24).

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.

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.

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.

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.

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. 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 nonwhite population group at 0.9 percent.

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 percent increase from 13,558 to 13,819 from 1990 to 2000. 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.

Employment and Income

Trempealeau County

In 1980, over four-fifths of Trempealeau County's 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

Wild bergamot. USFWS

(29 percent). While the Trempealeau County population has grown only by 3.2 percent over the last 20 years, 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.

Buffalo County

Buffalo County's employment growth between 1980 and 2001 has far outpaced its population growth. 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).

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.

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.

General Land Use and Management

Historically, the area surrounding Trempealeau NWR supported a variety of land uses (see Section on page 37 and Section on page 40). 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 viewscapes in the local area.

Bluffland development. New homes are continually being built on the wooded valley bluffs. Viewscapes 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.

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 development. 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).

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).

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 8 on page 38 and are described below.

Black Oak Island Natural Area

This 46-acre island complex is located in Pool A within the Trempealeau NWR (Figure 9 on page 44). 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.

Great River State Trail

See Section on page 40 for a description of the Great River State Trail.

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.

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 10).

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 Mississippi 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.

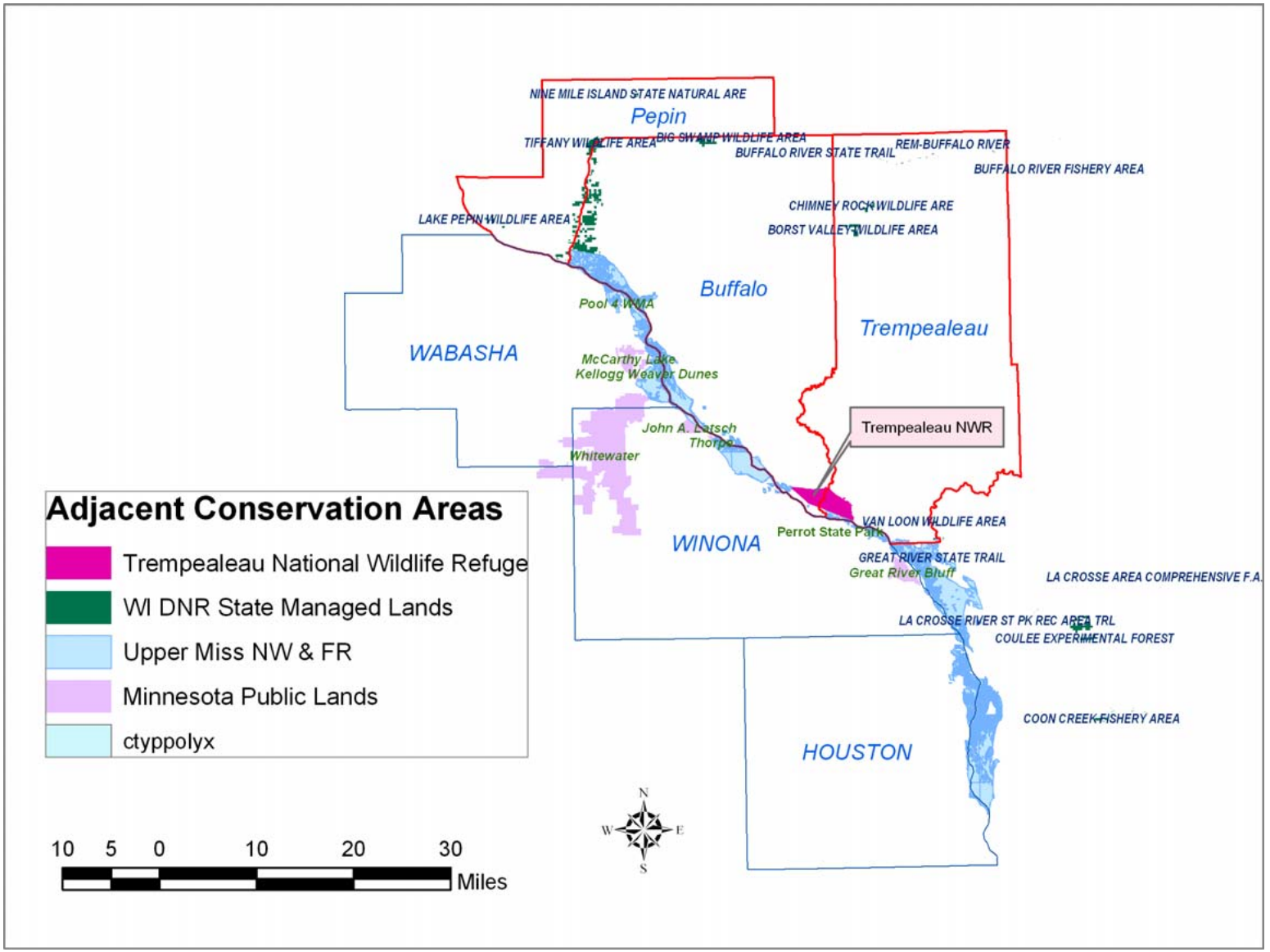
Perrot State Park lands border the Refuge on the east (Figure 10). This 1,400-acre property administered by Wisconsin DNR has several miles of hiking and cross-country ski trails that wind through mature upland forest and native grasslands called "goat prairies." Spectacular views of the Mississippi 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 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.

Trempealeau NWR volunteers planting swamp white oak. USFWS

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).

Figure 10: Adjacent Conservation Areas, Trempealeau NWR



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*

Agricultural Sector

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.

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: Management Direction

Summary

Over the course of the next 15 years, management will focus on returning upland areas to pre-European settlement habitats, increasing flexibility in wetland management within impoundments, and increasing public use opportunities.

Boundary issues will 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 will be purchased as opportunities arise.

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

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

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

Blazing star. USFWS

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

Public use opportunities will be expanded. Environmental education programs will be promoted at local schools and to community groups and the general public. A multi-purpose room will be added to the office/visitor contact station to accommodate

larger groups and provide a place for orientation. Waterfowl hunting opportunities will be expanded by opening the area west of the Canadian National Railroad dike to a limited hunt. Ski trails will be maintained when conditions permit. Options to alleviate flooding of the entrance road to provide year-round access to the Refuge will be explored.

Use of volunteers will be expanded in all programs. A Trempealeau NWR Friends Group will be started. Outreach will 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 will be developed.

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

Goals, Objectives and Strategies

Goal 1 Landscape

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

Figure 11 represents habitat and its management under this CCP and Figure 12 on page 55 represents visitor services. Figure 13 on page 56 represents a closer view of visitor services under this CCP.

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 3.)

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 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.

Figure 11: Habitat and its Management Under the Comprehensive Conservation Plan

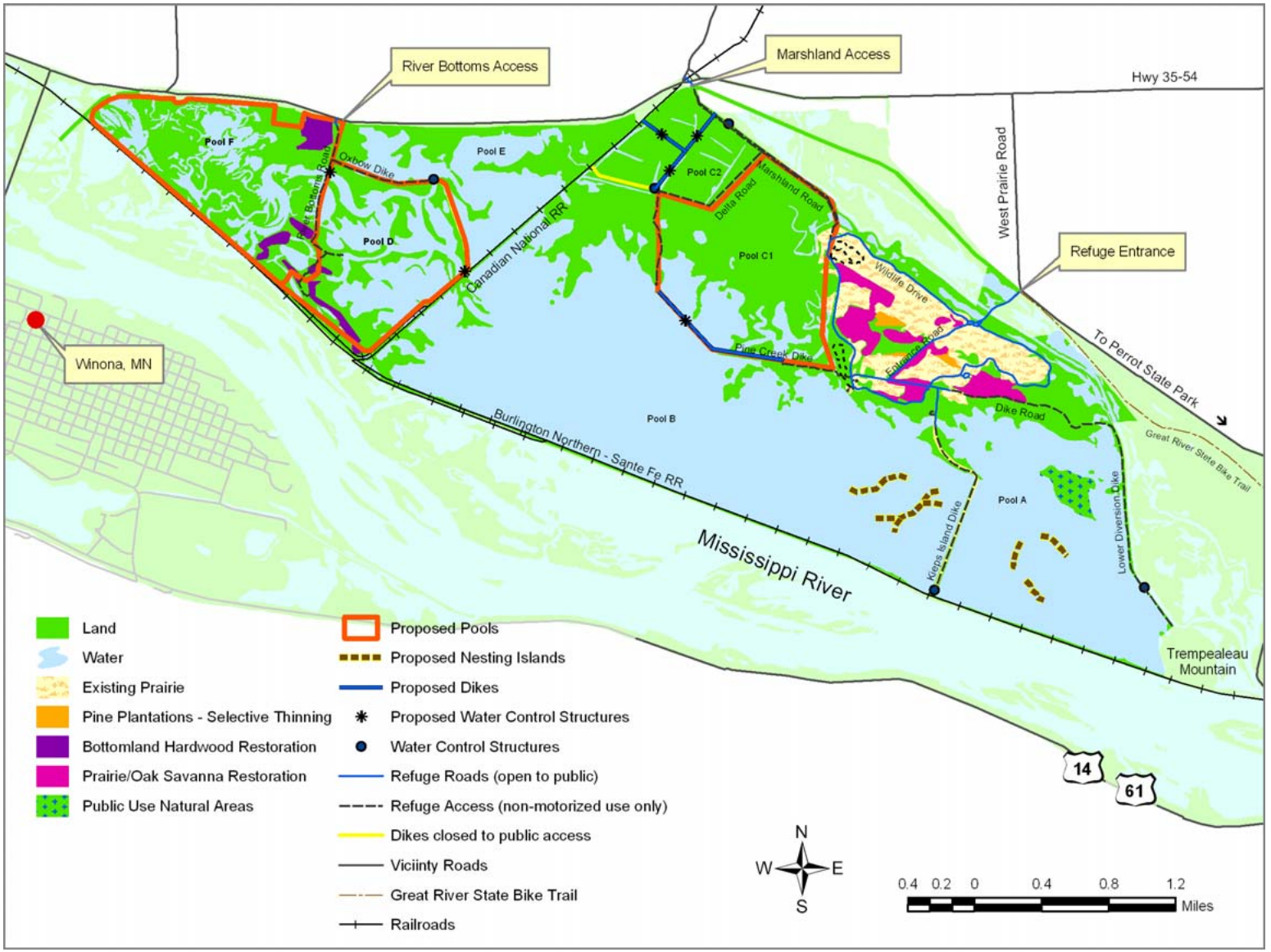


Figure 12: Visitor Services Under the Comprehensive Conservation Plan

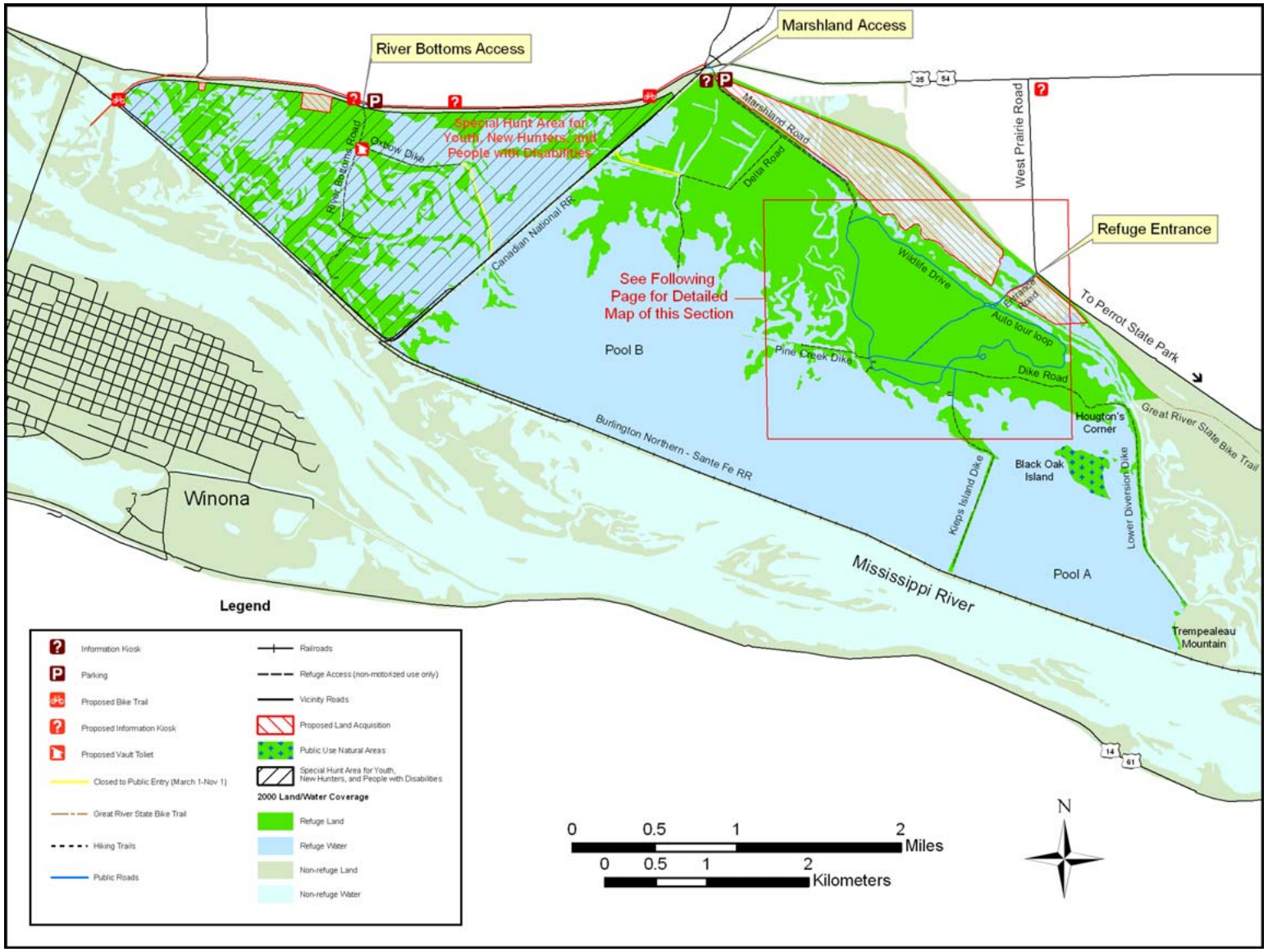


Figure 13: Visitor Services Close Up Under the Comprehensive Conservation Plan

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.
7. Protect swamp white oak in pool C2 by lowering water level during the growing season to avoid prolonged flooding.

European buckthorn in understory, Trempealeau NWR. USFWS

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 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

Swamp white oak tree planting area, Trempealeau NWR. USFWS

- 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 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.
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 14). 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.

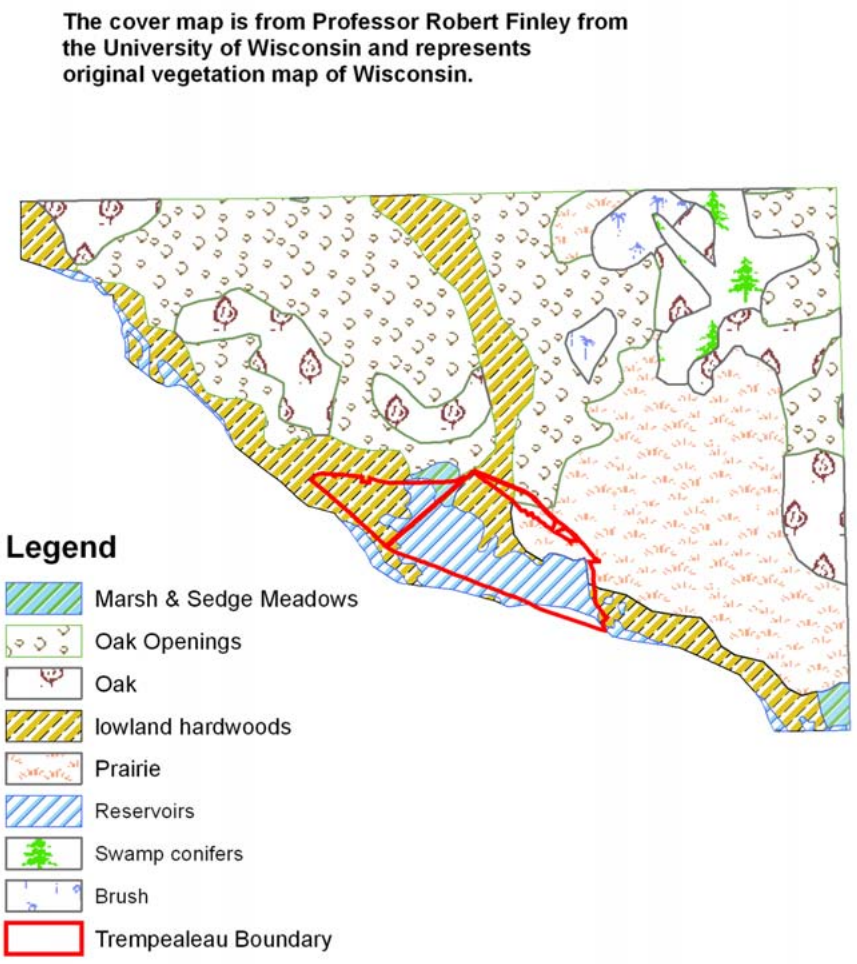
Today the invasive nature of black locust and the addition of other invasives such as buckthorn, have created forested areas on the upland sections of the Refuge consisting primarily of non-native species. Three hundred acres of the original 700 acres of prairie/oak savanna remain on the Refuge today. 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, 2008) 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.

Figure 14: Pre-European Settlement Vegetation, Trempealeau NWR



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 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 2. If conditions allow, once every 5 years prior to

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

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.

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 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 Man-

Invasive black locust taking over prairie, Trempealeau NWR. USFWS

agement 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.

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 Massassagua rattlesnakes.
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 2.7: 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

White-tailed deer. © Sandra Lines

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 overbrowsing 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.
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 trap-

ping 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.

Bird banding, Trempealeau NWR. USFWS

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.
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; redesign 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.

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.
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.

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.

Interpretation book reading at a local library. USFWS

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 principles 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, analyz-

ing, 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.
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.

Waterfowl hunt for people with disabilities at Trempealeau NWR. USFWS

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.

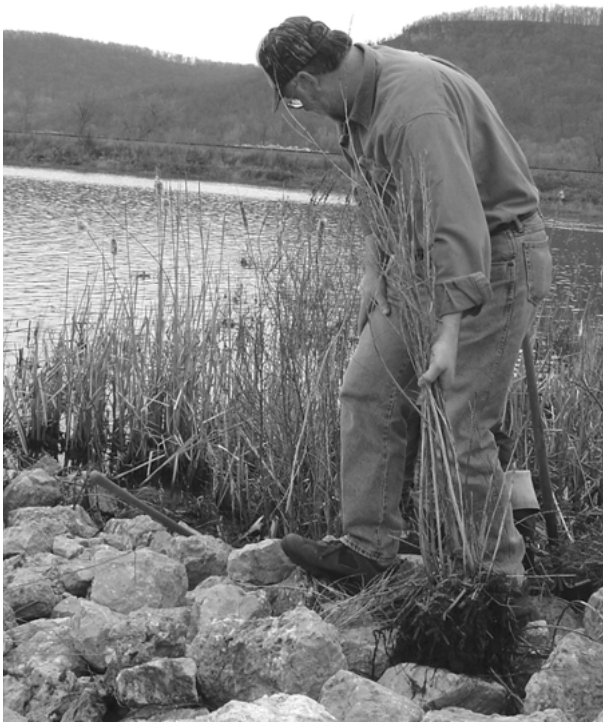
Objective 4.3: Volunteers

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.



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

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.
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 approached 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.
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.

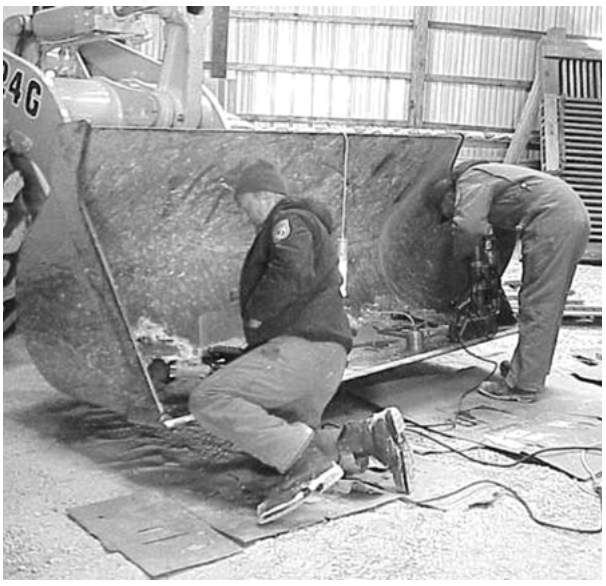
Objective 5.4: Operations and Maintenance Needs

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.



Equipment and facilities maintenance, Trempealeau NWR. USFWS

Chapter 5: Plan Implementation

Introduction

This appendix summarizes the actions, funding, coordination, and monitoring required to implement the Comprehensive Conservation Plan. 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.

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.

Trempealeau Mountain. © Sandra Lines

- 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 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.

Prairie habitat, Trempealeau NWR. USFWS

- 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 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, page 83). 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.

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 4.

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.

Bald Eagle. USFWS

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.
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.

Hunt Program for person with disabilities, Trempealeau NWR. USFWS

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 principles 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, 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.

Refuge Week school group visit, Trempealeau NWR. USFWS

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.
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.

Observation deck, Trempealeau NWR. USFWS

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.
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.

Environmental assessments or other documentation may also be needed to comply with National Environmental Policy Act or other requirements.

1. Actions – New Funding and Staff

The actions in the following charts 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 4.

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.

2. Summary of Step-Down Plans Needed

Below is a list of step-down plans called for in the 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. 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.

- Fire Management Plan (revise, 2013)
- Public Use Natural Area Management Plan (new, 2010)

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

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	
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 ft² 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

River Education Days, Trempealeau NWR. USFWS

- 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)

3. 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.

4. 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.

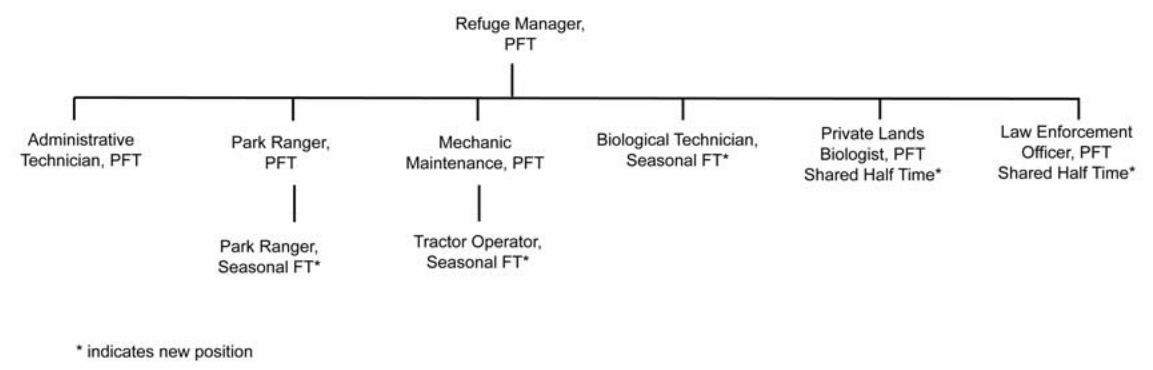
Since the CCP will be a constant reference and guide for Refuge staff, internal review will be continuous. In addition, it is expected that the public and partners will offer continuous feedback. At least every 3 years, representatives of the Corps of Engineers, the state, other agencies, and non-profit 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.

5. 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, forestry, 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

Figure 15: Staff Chart, Trempealeau NWR



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 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.

6. Proposed Staff Chart

Please see Figure 15.

Appendix A: Record of Decision

Record of Decision

for

Comprehensive Conservation Plan

Trempealeau

National Wildlife Refuge

U.S. Fish and Wildlife Service

Division of Conservation Planning
Bishop Henry Whipple Federal Building
Room 530
1 Federal Drive
Ft. Snelling, Minnesota 55105

Record of Decision for the Comprehensive Conservation Plan for Trempealeau National Wildlife Refuge

Introduction

This Record of Decision (ROD) has been developed by the U.S. Fish and Wildlife Service (Service) in compliance with agency decision-making requirements of the National Environmental Policy Act of 1969, as amended. It documents the decision of the Service, based on the information contained in the Final Environmental Impact Statement (FEIS) for the Comprehensive Conservation Plan and the entire administrative record. The Service has selected the preferred alternative (Alternative C) as described in the FEIS as the best alternative for the Comprehensive Conservation Plan for the Trempealeau National Wildlife Refuge (NWR). A notice of this decision will be published in the *Federal Register* and a news release will be sent to the media.

Purpose of Action

The purpose of this action is to specify and adopt a long-term management direction for the Trempealeau NWR that will achieve the Refuge purpose and the mission of the National Wildlife Refuge System.

Need for Action

A long-term management direction does not currently exist for Trempealeau NWR. A Comprehensive Conservation Plan will help ensure that management and administration of the Refuge will meet the need of achieving the mission of the Refuge System, the purpose for which the Refuge was established, and the goals for the Refuge. In addition, the Refuge Improvement Act of 1997 mandates that the Secretary of the Interior, and thus the Service, prepare Comprehensive Conservation Plans for all units of the National Wildlife Refuge System by October, 2012.

Key Issues

Through public scoping and with input from various agencies and publics, key issues and possible solutions were identified. The issues were grouped into five categories: 1) landscape, 2) wildlife and habitat, 3) public use, 4) neighboring landowners and community, and 5) administration and operations. These issues were thoroughly examined in the Draft and Final EIS.

Alternatives Considered

Three alternatives and their consequences were described in detail in the Draft and Final Environmental Impact Statement. Under all alternatives threatened and endangered species would be protected; cultural resources would be protected; the Refuge's Fire Management Plan would guide prescribed fire and wildfire suppression; mosquito control would only be allowed in cases of a documented human health emergency; appropriate control of fish and wildlife disease would be undertaken if warranted, feasible, and effective; an emergency response plan and training would be developed to address possible contaminant spills; regulations regarding harvesting of fruit,

nuts, and other plant parts would be clarified; neighboring landowners would be contacted frequently to discuss issues of concern; an easement and rights-of-way management plan would be developed; and general public use regulations would be annually reviewed and updated.

Alternative A. No Action (Current Direction)

Present management practices would continue under this Alternative. The No Action alternative is a status quo alternative where current conditions and trends continue. The alternative served as the baseline to compare and contrast with the other alternatives.

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. Staff would include the addition of 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.

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 as in Alternative B. 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. 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.

Environmentally Preferable Alternative

Based on a review of the environmental consequences of each alternative (Chapter 4, Final EIS), Alternative C is judged to be the environmentally preferable alternative. All alternatives have positive physical and biological environmental consequences since all contain similar emphasis on increasing habitat quantity and quality. However, Alternative C also addresses a variety of social and economic issues in balancing the needs of fish and wildlife and the needs of people.

Basis for the Decision

The Service selected Alternative C, as described in the FEIS, as the best alternative for the Comprehensive Conservation Plan to guide refuge management for the next 15 years. Alternative C is the most environmentally preferable alternative. Chapter 1 of the Final EIS identified three broad needs: 1) contribute to the Refuge System mission, 2) fulfill the purposes of the Refuge, and 3) achieve Refuge goals. Alternative C meets these needs through the most balanced and integrated approach compared to the other alternatives. The rationale for choosing the selected alternative as the best alternative for the Comprehensive Conservation Plan is based on the impact of this alternative on the issues and concerns that surfaced during the planning process. The environmental impacts of the alternatives were analyzed as to how they would impact: 1) landscape, 2) wildlife and habitat, 3) public use, 4) neighboring landowners and community, and 5) administration and operations. Alternative C has long-term benefits to the natural and human environment. Alternative C will increase water quality and more effectively control invasive plants. Alternative C ensures abundant opportunity for all current recreational uses (e.g. hunting, fishing, observation and photography, interpretation and environmental education). Alternative C will have a positive economic impact. Alternative C will increase the capacity of the Refuge to meet its purposes and mission of the Refuge System. The alternative identifies staffing needs tied to objectives and strategies to increase the capacity of the Refuge to meet its purpose and the Refuge System mission. It also addresses infrastructure needs for effective and efficient administration and management of the Refuge while serving the needs of the visiting public. Alternative C is also expected to lead to improved communication and problem solving with neighboring land owners.

Public Comments to FEIS

The Service filed the FEIS for the Comprehensive Conservation Plan for Trempealeau National Wildlife Refuge with the Environmental Protection Agency (EPA, which published a notice of availability of the FEIS on April 25, 2008. In compliance with agency decision-making

requirements of the National Environmental Policy Act of 1969, as amended, the Service is required to circulate the FEIS for 30 days after filing with the EPA before issuing a Record of Decision on the Comprehensive Conservation Plan.

During the 30-day circulation period, which ended May 27, 2008, the Service received one comment, which expressed opposition to hunting. The Service had responded to this comment in the FEIS.

Mitigation

Because all practicable means to avoid or minimize environmental harm have been incorporated into the preferred alternative, no mitigation measures have been identified.

Conclusion

Based on a thorough review of the Administrative Record for this project, and careful consideration of the full range of impacts from the Comprehensive Conservation Plan on all aspects of the human environment, including the social, economic, cultural, and natural resources of the area, I have decided to implement the Comprehensive Conservation Plan for the Trempealeau National Wildlife Refuge as described in Alternative C in the FEIS (April 2008).

Robyn Thorson — Date

Regional Director

U.S. Fish and Wildlife Service

Appendix B: Glossary

Appendix B: Glossary

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 procession and use of the property.

Cool Season Grasses

Grasses that complete their maximum growth and set seed early in the growing season and are dormate 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 and 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 WaterConservation 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, wildfire 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 SettlementHabitats

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 C: Species Lists

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.

Bird Species

Bird Species Found on Trempealeau NWR

		Special Status					Seasonal Abundance: a= abundant (seaonally 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]
Avocets and Stilts											
Avocet, American	*Recurvirostra americana*					2	r	r	r		m
Stilt, Black-necked	*Himantopus mexicanus*										a
Blackbirds and Allies											
Blackbird, Brewer's	*Euphagus cyanocephalus*						u	u	u	r	b
Blackbird, Red-winged	*Agelaius phoeniceus*						a	a	a	u	b
Blackbird, Rusty	*Euphagus carolinus*					2	c		c	u	m
Blackbird, Yellow-headed	*Xanthocephalus xanthocephalus*						u	u	u		b
Bobolink	*Dolichonyx oryzivorus*						u	u	u		b
Cowbird, Brown-headed	*Molothrus ater*						a	a	u	r	b
Grackle, Common	*Quiscalus quiscula*						a	a	a	u	b
Meadowlark, Eastern	*Sturnella magna*						c	c	c	u	b
Meadowlark, Western	*Strunella neglecta*						r	r	r		b
Oriole, Baltimore	*Icterus galbula*						c	a			b
Oriole, Orchard	*Icterus spurius*						u	u			b
Cardinals and Allies											
Bunting, Indigo	*Passerina cyanea*						c	c	c		b
Bunting, Snow	*Plectrophenax nivalis*								r	u	m
Cardinal, Northern	*Cardinalis cardinalis*						a	a	c	c	b
Dickcissel	*Spiza americana*					2	c	c			b
Grosbeak, Rose-breasted	*Pheucticus ludovicianus*						c	c	c		b

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seaonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
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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 erythropthalmus*			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

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Duck, Ring-necked	*Aythya collaris*						a	r	a		m
Duck, Ruddy	*Oxyura jamaicensis*						c	r	c	r	m
Duck, Wood	*Aix sponsa*			X			a	c	a	r	b
Gadwall	*Anas strepera*						c	u	a		m
Goldeneye, Common	*Bucephala clangula*						a		a	c	m
Goose, Canada	*Branta canadensis*			X			a	c	a	c	b
Goose, Snow	*Chen caerulescens*			X			u		u		m
Mallard	*Anas platyrhynchos*			X			a	c	a	c	b
Merganser, Common	*Mergus merganser*						r		r	c	m
Merganser, Hooded	*Lophodytes cucullatus*				16		c	c	c	r	b
Pintail, Northern	*Anas acuta*			X			c	r	c	r	m
Redhead	*Aythya americana*				16		c	r	c	u	m
Scaup, Greater	*Aythya marila*				16		u		u		m
Scoter, Surf	*Melanitta perspicillata*										a
Scoter, White-winged	*Melanitta fusca*						r		u	r	m
Shoveler, Northern	*Anas clypeata*						c	u	c		m
Swan, Mute	*Cygnus olor*						r	r	r	r	b
Swan, Trumpeter	*Cygnus buccinator*		E				r	r	u	r	b
Swan, Tundra	*Cygnus columbianus*						a		a	u	m
Teal, Blue-winged	*Anas discors*			X			a	c	a		b
Teal, Cinnamon	*Anas cyanoptera*										a
Teal, Green-winged	*Anas crecca*			X			c	r	c	r	m
Wigeon, American	*Anas americana*						a	u	a		m
Wigeon, Eurasian	*Anas penelope*										a
Emberizid Finches, Sparrows and Allies											
Junco, Dark-eyed	*Junco hyemalis*						a		a	a	m

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Longspur, Lapland	*Calcarius lapponicus*						r		r	r	m
Sparrow, American Tree	*Spizella arborea*						c		a	a	m
Sparrow, Chipping	*Spizella passerina*						a	c	a		b
Sparrow, Clay-colored	*Spizella pallida*						u		u		m
Sparrow, Field	*Spizella pusilla*						a	c	c	r	b
Sparrow, Fox	*Passerella iliaca*						c		c		m
Sparrow, Grasshopper	*Ammodramus savannarum*						c	c	u		b
Sparrow, Harris'	*Zonotrichia querula*					2	u		u		m
Sparrow, Henslow's	*Ammodramus henslowii*		T			1	r		r		m
Sparrow, Lark	*Chondestes grammacus*						u	u			b
Sparrow, Le Conte's	*Ammodramus leconteii*						r	r	r		m
Sparrow, Lincoln's	*Melospiza lincolnii*						u		u		m
Sparrow, Savannah	*Passerculus sandwichensis*						u	u	u		b
Sparrow, Song	*Melospiza melodia*						a	a		u	b
Sparrow, Swamp	*Melospiza georgiana*						c	c	r		b
Sparrow, Vesper	*Pooecetes gramineus*						u	u	u		b
Sparrow, White-crowned	*Zonotrichia leucophrys*						u		u	r	m
Sparrow, White-throated	*Zonotrichia albicollis*						c		c	r	m
Towhee, Eastern	*Pipilo erythrophtlalmus*						u	u	u	r	b
Falcons											
Falcon, Peregrine	*Falco peregrinus*		E	X	16		u	u	u		b
Kestrel, American	*Falco sparverius*						c	c	c	u	b
Merlin	*Falco columbarius*						u		u		m

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Finches											
Crossbill, Red	*Loxia curvirostra*						r			r	m
Finch, House	*Carpodacus mexocanus*						c	c	c	c	b
Finch, Purple	*Carpodacus purpureus*						u		u	u	m
Goldfinch, American	*Carduelis tristis*						a	a	a	c	b
Grosbeak, Evening	*Coccothraustes verpertinus*									r	m
Grosbeak, Pine	*Pinicola enucleator*										a
Redpoll, Common	*Carduelis flammea*						u			u	m
Redpoll, Hoary	*Carduelis hornemanni*									r	m
Siskin, Pine	*Carduelis pinus*						u		u	u	m
Gnatcatchers											
Gnatcatcher, Blue-gray	*Polioptila caerulea*						c	c	u		b
Grebes											
Grebe, Horned	*Podiceps auritus*					2	u		u		m
Grebe, Pied-billed	*Podilymbus podiceps*						c	c	c		b
Grebe, Red-necked	*Podiceps grisegena*		E				r		r		m
Grebe, Western	*Aechmophorus occidentalis*										a
Gulls and Terns											
Gull, Bonaparte's	*Larus philadelphia*						u		u		m
Gull, Franklin's	*Larus pipixcan*						u		u		m
Gull, Herring	*Larus argentatus*						c	u	c	u	m
Gull, Ring-billed	*Larus delawarensis*						c	u	c	u	m
Jaeger, Parasitic	*Stercorarius parasiticus*										a
Kittewake, Black-Legged	*Rissa tridactyla*										a

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Tern, Black	*Chlidonias niger*			X	16		c	c	u		b
Tern, Caspian	*Sterna caspia*		E				u	u	u		m
Tern, Common	*Sterna hirundo*		E	X			u	u	u		m
Tern, Forster's	*Sterna forsteri*		E	X			c	u	u		b
Tern, Least	*Sterna antillarum*			X		2					a
Hawks, Kites and Eagles											
Eagle, Bald	*Haliaeetus leucocephalus*	T		X	16		c	c	a	c	b
Eagle, Golden	*Aquila chrysaetos*						r		u	r	m
Goshawk, Northern	*Accipiter gentilis*			X	16				r	u	m
Harrier, Northern	*Circus cyaneus*						u	u	u	u	b
Hawk, Broad-winged	*Buteo platypterus*						c	u	a		b
Hawk, Cooper's	*Accipiter cooperii*						u	u	c	u	b
Hawk, Red-shouldered	*Buteo lineatus*		T	X			u	u	u	r	b
Hawk, Red-tailed	*Buteo Jamaicensis*						c	c	a	c	b
Hawk, Rough-legged	*Buteo lagopus*						u		u	u	m
Hawk, Sharp-shinned	*Accipiter striatus*						c	u	a	u	m
Hawk, Swainson's	*Buteo swainsoni*			X		2			r		m
Osprey	*Pandion haliaetus*		T				u	u	c		b
Herons, Egrets, and Bitterns											
Bittern, American	*Botaurus lentiginosus*			X			u	u	u		b
Bittern, Least	*Ixobrychus exilis*						u	u	u		b
Egret, Cattle	*Bubulcus ibis*						u	r	u		m
Egret, Great	*Ardea alba*		T				a	c	a		b
Egret, Snowy	*Egretta thula*		E				r	r			m
Heron, Black-crowned Night-heron	*Nycticorax nycticorax*			X			u	u	r		b

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Heron, Great Blue	*Ardea herodias*						a	a	a	r	b
Heron, Green	*Butorides virescens*						c	c	c		b
Heron, Little Blue	*Egretta caerulea*					2		u			m
Heron, Yellow-crowned Night-heron	*Nyctanassa violacea*		T				u	r	u		b
Hummingbirds											
Hummingbird, Ruby-throated	*Archilochus colubris*						u	c	u		b
Ibises											
Ibis, Glossy	*Plegadis falcinellus*										a
Ibis, White	*Eudocimus albus*										a
Ibis, White-faced	*Plegadis chihi*										a
Kingfishers											
Kingfisher, Belted	*Ceryle alcyon*						c	c	u	u	b
Kinglets											
Kinglet, Golden-crowned	*Regulus satrapa*						u		u	r	m
Kinglet, Ruby-crowned	*Regulus calendula*						c		c		m
Larks											
Lark, Horned	*Eremophila alpestris*						r	r	r	u	b
Loons											
Loon, Common	*Gavia immer*						u		u		m
Loon, Red-throated	*Gavia stellata*										a
Mockingbirds and Thrashers											
Catbird, Gray	*Dumetella carolinensis*						c	c	c		b
Mockingbird, Northern	*Mimus polyglottos*						r	u	r		m
Thrasher, Brown	*Toxostoma rufum*						c	c	c		b

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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 erythrothynchos*						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

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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

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Sandpiper, Solitary	*Tringa solitaria*					2	u	u	u		m
Sandpiper, Spotted	*Actitis macularia*						c	c	c		b
Sandpiper, Stilt	*Calidris himantopus*			X		2	u	u	u		m
Sandpiper, Upland	*Bartramia longicauda*			X	16	2	r	r			b
Sandpiper, Western	*Calidris mauri*					2	r				m
Sandpiper, White-rumped	*Calidris fuscicollis*						u	u	u		m
Snipe, Common	*Gallinago gallinago*						c	u	c	u	m
Turnstone, Ruddy	*Arenaria interpres*						u	r	u		m
Willet	*Catoptrophorus semipalmatus*						r	r	r		m
Woodcock, American	*Scolopax minor*			X	16	2	u	u	u		b
Yellowlegs, Greater	*Tinga melanoleuca*			X			u	u	u		m
Yellowlegs, Lesser	*Tringa flavipes*					2	c	c	c		m
Shrikes											
Shrike, Loggerhead	*Lanius ludovicianus*		E	X	32,16		r	r	r		b
Shrike, Northern	*Lanius excubitor*						u		u	u	m
Starlings											
Starling, European	*Strunus vulgaris*						a	a	a	c	b
Swallows											
Martin, Purple	*Progne subis*						u	u	u		b
Swallow, Bank	*Riparia riparia*						c	u	u		b
Swallow, Barn	*Hirundo rustica*						c	c	c		b
Swallow, Cliff	*Petrochelidon pyrrhonota*						u	r	u		b
Swallow, Northern Rough-winged	*Stelgidopteryx serripennis*						c	c	u		b

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Swallow, Tree	*Tachycineta bicolor*						a	a	c		b
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

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Vireo, Blue-headed	*Vireo solitarius*						u	u	u		m
Vireo, Philadelphia	*Vireo philadelphicus*						u		u		m
Vireo, Red-eyed	*Vireo olivaceus*						a	a	a		b
Vireo, Warbling	*Vireo gilvus*						a	a	a		b
Vireo, Yellow-throated	*Vireo flavifrons*						u	u			b
Vultures											
Vulture, Turkey	*Cathartes aura*						c	c	c	r	m
Waxwings											
Waxwing, Bohemian	*Bombycilla garrulus*									r	m
Waxwing, Cedar	*Bombycilla cedrorum*						c	c	c	u	b
Wood Warblers											
Chat, Yellow-breasted	*Icteria virens*						r	r			b
Ovenbird	*Seiurus aurocapillus*						c	u	u		b
Parula, Northern	*Parula americana*						r		u		m
Redstart, American	*Setophaga ruticilla*						a	a	c		b
Warbler, Bay-breasted	*Dendroica castanea*					2	r				m
Warbler, Black-and-white	*Mniotilta varia*						c		c		m
Warbler, Blackburnian	*Dendroica fusca*						c		c		m
Warbler, Blackpoll	*Dendroica striata*						c		c		m
Warbler, Black-throated Blue	*Dnedroica caeruulescens*						r		r		m
Warbler, Black-throated Green	*Dendroica virens*						u		u		m
Warbler, Blue-winged	*Vermivora pinus*			x	16	3	u	u			b
Warbler, Canada	*Wilsonia canadensis*					2	r		u		m
Warbler, Cape May	*Dendroica tigrina*						u		u		m

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Warbler, Cerulean	*Dendroica cerulea*		T			2	u	u			b
Warbler, Chestnut-sided	*Dendroica pensylvanica*						c		u		m
Warbler, Golden-winged	*Vermivora chrysoptera*					1	u	u	u		m
Warbler, Magnolia	*Dendroica magnolia*						u		u		m
Warbler, Mourning	*Oporornis philadelphia*						r	r	u		m
Warbler, Nashville	*Vermivora ruficapilla*						c		c		m
Warbler, Orange-crowned	*Vermivora celata*						r		u		m
Warbler, Palm	*Dendroica palmarum*						c		c		m
Warbler, Prothonotary	*Protonotaria citrea*					2	c	c			b
Warbler, Tennessee	*Vermivora peregrina*						c		c		m
Warbler, Wilson's	*Wilsonia pusilla*						u		u		m
Warbler, Yellow	*Dendroica petechia*						a	a	u		b
Warbler, Yellow-rumped	*Dendroica coronata*						a		a		m
Warbler, Yellow-throated	*Dendroica dominica*						r	r			b
Waterthrush, Louisiana	*Seiurus motacilla*						u	u	u		m
Waterthrush, Northern	*Seiurus noveboracensis*						c		u		m
Yellowthroat, Common	*Geothlypis trichas*						a	a	c		b
Woodpeckers											
Flicker, Northern	*Colaptes auratus*						c	c	c	u	b
Sapsucker, Yellow-bellied	*Sphyrapicus varius*						c	c	c	r	b
Woodpecker, Downy	*Picoides pubescens*						c	c	c	c	b
Woodpecker, Hairy	*Picoides villosus*						c	c	c	c	b
Woodpecker, Pileated	*Dryocopus pileatus*						u	u	u	u	b
Woodpecker, Red-bellied	*Melanerpes carolinus*						c	c	c	c	b
Woodpecker, Red-headed	*Melanerpes erythrocephalus*			X	16	2	u	u	u	r	b

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seaonally 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]
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 abudant species with declines or high threats; 3=species with restricted distributions and low population size.*
3. *(m) Breeding (b) Accidental (a*

Mammal List

Mammals List, Trempealeau NWR

		Federally (T or E)	Wisconsin (T or E)	RCP
Common Name	**Species (Scientific Name)**			
Bats				
Bat, Big Brown	*Eptescius fuscus*			
Bat, Hoary	*Lasiurus cinerus*			
Bat, Northern Long-eared Myotis	*Myotis septentrionalis*			
Bat, Little Brown	*Myotis lucifugus*			
Bat, Red	*Lasiurus borealis*			
Bat, Silver-haired	*Lasionycteris noctivagans*			
Pipistrel, Eastern	*Pipistrellus subflavus*			
Carnivores				
Badger	*Taxida taxus*			
Bear, Black	*Ursus americanus*			
Bobcat	*Lynx rufus*			
Coyote	*Canis latrans*			
Fox, Gray	*Urocyon cineroargenteus*			
Fox, Red	*Vulpes fulva*			
Mink	*Mustela vison*			
Otter, River	*Lutra canadensis*			
Raccoon	*Procyon lotor*			
Skunk, Spotted	*Spilogale putorius*			
Skunk, Striped	*Mephitis mephitis*			
Weasel, Least	*Mustela nivalis*			
Weasel, Long-tailed	*Mustela frenata*			
Weasel, Short-tailed	*Mustela erminea*			
Hooved Animals				
Deer, White-tailed	*Odocoileus virginianus*			
Insectivores				
Shrew, Least	*Cryptotis parva*			
Shrew, Masked	*Sorex cinereus*			

Mammals List, Trempealeau NWR (Continued)

Common Name	Species (Scientific Name)	Federally (T or E)	Wisconsin (T or E)	RCP
Shrew, Short-tailed	*Blarina brevicauda*			
Marsupials				
Opossum, Virginia	*Didelphis virginiana*			
Rabbits				
Rabbit, Eastern Cottontail	*Sylvilagus floridanus*			
Rodents				
Beaver	*Castor canadensis*			
Chipmunk, Eastern	*Tamias striatus*			
Gopher, Plains Pocket	*Geomys bursarius*			
Lemming, Southern Bog	*Synaptomys cooperi*			
Mouse, Deer	*Peromyscus maniculatus*			
Mouse, House	*Mus musculus*			
Mouse, Meadow Jumping	*Zapus hudsonius*			
Mouse, Western Harvest	*Reithrodontomy megalotis*			
Mouse, White-footed	*Peromyscus leucopus*			
Muskrat	*Ondatra zibethicus*			
Rat, Norway	*Rattus norvegicus*			
Squirrel, Eastern Fox	*Sciurus niger*			
Squirrel, Eastern Gray	*Sciurus carolinensus*			
Squirrel, Franklin's Ground	*Spermophilis franklinii*			
Squirrel, Red	*Tamiasciurus hudsonicus*			
Squirrel, Southern Flying	*Glaucomys volans*			
Squirrel, Thirteen-lined Ground	*Spermophilus tridecemlineatus*			
Vole, Meadow	*Microtus pennsylvanicus*			
Vole, Woodland	*Microtus pinetorum*			
Vole, Prairie	*Microtus ochrogastor*			
Woodchuck	*Mormota monax*			

[1] E (Endangered); T (Threatened)
[2] RCP (Regional Conservation Priority; FWS, Region 3)

Reptiles List

List of Reptiles Found on Trempealeau NWR

Common Name	Species (Scientific Name)	Federally (T or E) [1]	Wisconsin (T or E) [1]	RCP [2]
Lizards				
Racerunner, Prairie[1]	*Cnemidophorus sexlineatus virdis*			
Snakes				
Bullsnake	*Pituophis melanoleucus*			
Snake, Massasauga	*Sistrurus catenatus*	C	E	X
Rattlesnake, Timber	*Crotalus horridus*			X
Snake, Brown	*Storeria dekayi*			
Snake, Eastern Garter	*Thamnophis sirtalis*			
Snake, Eastern Hognose	*Heterodon platirhinos*			
Snake, Milk	*Lampropeltis triangulum*			
Snake, Northern Red-bellied	*Storeria occipitomaculata*			
Snake, Northern Water	*Nerodia sipedon*			
Snake, Prairie Ringneck	*Diadophis punctatus arnyi*			
Turtles				
Turtle, Blanding's	*Emydoidea blandingii*		T	
Turtle, False Map	*Graptemys pseudogeographica*			
Turtle, Map	*Graptemys geographica*			
Turtle, Painted	*Chysemys picta*			
Turtle, Smooth Softshell	*Apalone mutica*			
Turtle, Snapping	*Chelydra serpentina*			
Turtle, Spiny Softshell	*Apalone spinifera*			
Turtle, Ouachita Map	*Graptemys ouachitensis*			
Turtle, Wood	*Clemmys insculpta*		T	
Turtle, Common Musk	*Sternothernus odoratus*			

[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.

Amphibians List

List of Amphibians Found on Trempealeau NWR

Common Name	Species (Scientific Name)	Federally (T or E)[1]	Wisconsin (T or E)[1]	RCP[2]
Frogs and Toads				
Bullfrog	*Rana catesbeiana*			
Frog, Green	*Rana clamitans*			
Frog, Blanchard's Cricket	*Acris crepitans blanchardi*		E	
Frog, Northern Leopard	*Rana pipiens*			
Frog, Pickerel	*Rana palustris*			
Frog, Western Chorus	*Pseudacris triseriata*			
Frog, Wood	*Rana sylvatica*			
Peeper, Spring	*Pseudacris crucifer*			
Toad, American	*Bufo americanus*			
Treefrog, Gray	*Hyla versicolor*			
Treefrog, Cope's Gray	*Hyla chrysoscelis*			
Salamanders				
Mudpuppy	*Necturus maculosus*			
Salamander, Blue-spotted	*Ambystoma laterale*			
Salamander, Eastern Tiger	*Ambystoma tigrinum*			
Newt, Central	*Notophthalmus virdescens louisianensis*			

[1] E (Endangered); T (Threatened)
[2] RCP (Regional Conservation Priority; FWS, Region 3)

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	*Morone chrysops*				C
Bowfin Family	*Amiidae*				
Bowfin	*Amia calva*				C
Catfish Family	*Ictaluridae*				
Bullhead, Black	*Ameiurus melas*				O
Bullhead, Brown	*Ameiurus nebulosus*				O
Bullhead, Yellow	*Ameiurus natalis*				O
Catfish, Channel	*Ictalurus punctatus*				C
Madtom, Tadpole	*Noturus gyrinus*				O
Drums	Scieaenidae				
Drum, Freshwater	*Aplodinotus grunniens*				C
Gar	Lepisosteidae				
Gar, Longnose	*Lepisosteus osseus*				C
Gar, Shortnose	*Lepisosteus platostomus*				C
Herring Family	Clupeidae				
Shad, Gizzard	*Dorosoma cepedianum*				A
Minnows	Cyprinidae				
Carp, Common	*Cyprinus carpio*				A
Minnow, Bluntnose	*Pimephales notatus*				O
Minnow, Bullhead	*Pimephales vigilax*				A
Minnow, Fathead	*Pimephales promelas*				U
Shiner, Emerald	*Notropis atherinoides*				A
Shiner, Golden	*Notemigonus crysoleucas*				O
Shiner, River	*Notropis blennius*				A
Shiner, Spotfin	*Cyprinella spiloptera*				C
Shiner, Spottail	*Notropis hudsonius*				C
Mooneye Family	Hiodontidae				
Mooneye	*Hiodon tergisus*				C
Mudminnows	Umbridae				
Mudminnow, Central	*Umbra limi*				

List of Fish Species Found on Tremplealeau NWR

Fish*		Federally (T or E)[1]	Wisconsin (T or E)	RCP[2]	Pool 6[3]
Common Name	**Species (Scientific Name)**				
Darter, Johnny	*Etheostoma nigrum*				U
Perch, Yellow	*Perca flavescens*				C
Walleye	*Stizostedion vitreum*			X	C
Pike Family	Esocidae				
Pike, Northern	*Esox lucius*				C
Silversides	Atherinidae				
Silverside, Brook	*Labidesthes sicculus*				C
Suckers	Catostomidae				
Buffalo, Bigmouth	*Ictiobus cyprinellus*				C
Buffalo, Smallmouth	*Ictiobus bubalus*				O
Quillback	*Carpiodes cyprinus*				C
Redhorse, Golden	*Moxostoma erythrurum*				U
Redhorse, Shorthead	*Moxostoma macrolepidotum*				C
Sucker, White	*Catostomus commersoni*				C
Sunfish Family	Centrarchidae				
Bass, Largemouth	*Micropterus salmoides*				C
Bass, Smallmouth	*Micropterus dolomieu*				O
Bluegill	*Lepomis macrochirus*				A
Crappie, Black	*Pomoxis nigromaculatus*				C
Crappie, White	*Pomoxis annularis*				C
Pumpkinseed	*Lepomis gibbosus*				C
Sunfish, Green	*Lepomis cyanellus*				O
Sunfish, Orange-spotted	*Lepomis humilis*				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 tributory 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.

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
*Abutilon theophrasti Medikus**	Malvaceae	Velvetleaf
Acalypha rhomboidea Raf.	Euphorbiaceae	Three-seeded mercury
Acer negundo L.	Aceraceae	Box elder
Acer rubrum L.	Aceraceae	Red maple
Acer saccharinum L.	Aceraceae	Silver maple
Acer saccharum Marsh.	Aceraceae	Sugar maple
*Achillea millefolium****	Asteraceae	Common yarrow
Acorus calamus L.	Araceae	Sweet flag
Actaea alba (L.) Miller	Ranunculaceae	White baneberry
Actaea rubra (Aiton) Willd.	Ranunculaceae	Red baneberry
Agalinis purpurea (L.) Penn.	Scrophulariaceae	Large purple agalinis
Agastache scrophulariaefolia (Willd.) Kuntze	Lamiaceae	Purple giant hyssop
Agrimonia parviflora Ait.	Rosaceae	Southern agrimony
*Agropyron repens****	Gramineae	Quack grass
Agrostis gigantea Roth.	Poaceae	Red top
Alisma gramineum Lej.	Alismataceae	Grass-leaved water plantain
Alisma subcordatum Raf.	Alismataceae	Southern water plantain
Alisma triviale Pursh	Alismataceae	Northern water plantain
Alliaria petiolata,***	Brassicaceae	Garlic mustard
Allium canadense L.	Liliaceae	Wild garlic
*Allium cernuum****	Liliaceae	Nodding wild onion
*Allium stellatum ****	Liliaceae	Wild Onion
Allium tricoccum Ait.	Liliaceae	Wild leek
Alnus serrulata (Ait.) Willd.	Betulaceae	Alder
Alopecurus geniculatus L.	Poaceae	Marsh foxtail
Amaranthus hybridus L.	Amaranthaceae	Green amaranth
Amaranthus rudis Sauer	Amaranthaceae	Water hemp (Tall amaranth)

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Amaranthus spinosus L.	Amaranthaceae	Spiny pigweed
Amaranthus tuberculatus (Nutt.) Moq.	Amaranthaceae	Water hemp
Ambrosia artemisiifolia L.	Asteraceae	Common ragweed
*Ambrosia trifida L.****	Asteraceae	Giant ragweed
Amelanchier canadensis (L.) Medikus	Rosaceae	Eastern serviceberry
Ammania coccinea Rottb.	Lythraceae	Toothcup
*Amorpha canescens****	Fabaceae	Lead plant
Amorpha fruticosa L.	Fabaceae	False indigo
Ampelamus albidus (Nutt.) Britton	Asclepiadaceae	Climbing milkweed
Ampelopsis cordata Michx.	Asclepiadaceae	Sandvine
Amphicarpa bracteata (L.) Fern.	Fabaceae	Hog peanut
Andropogon gerardii Vitman	Poaceae	Big bluestem
Anemone canadensis L.	Ranunculaceae	Canada anemone
*Anemone cylindrica****	Ranunculaceae	Long-headed thimbleweed
Anemone quinquefolia L.	Ranunculaceae	Wood anemone
*Anemone virginiana****	Ranunculaceae	Thimbleweed or Tall Anemone
*Antennaria neglecta****	Asteraceae	Field cat's foot
Apios americana Medic.	Fabaceae	Ground nut
Apocynum cannabinum L.	Araliaceae	Indian hemp
Apocynum sibiricum Jacq.	Araliaceae	Clasping dogbane
*Arabis lyrata****	Cruciferae	Lyre-leaved rock cress
Aralia nudicaulis L.	Araliaceae	Wild sasparilla
Aralia racemosa L.	Araliaceae	Spikenard
Arisaema dracontium (L.) Schott.	Araceae	Green dragon
Aristida oligantha Michx.	Poaceae	Prairie three-awn
Asarum canadense L.	Aristolochiaceae	Wild ginger
Asclepias hirtella (Pennell) Woodson	Asclepiadaceae	Prairie milkweed
*Asclepias incarnata L. ****	Asclepiadaceae	Swamp milkweed
Asclepias purpurascens L.	Asclepiadaceae	Purple milkweed
Asclepias speciosa Torr.	Asclepiadaceae	Showy milkweed
*Asclepias syriaca****	Asclepiadaceae	Common milkweed
*Asclepias tuberosa****	Asclepiadaceae	Butterfly Milkweed
*Asparagus officinalis L.**	Liliaceae	Garden asparagus
Aster drummondii Lindl.	Asteraceae	Drummond's aster
*Aster ericoides****	Asteraceae	Heather aster
*Aster laevas****	Asteraceae	Smooth Aster
*Aster lanceolatus ****	Compositae	Eastern-lined Aster
*Aster lanceolatus Willd.****	Asteraceae	Eastern-lined aster
*Aster novae-anglei****	Asteraceae	New-England aster
*Aster oblongifolium****	Compositae	Aromatic aster

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Aster ontarionis Wieg.	Asteraceae	Bottomland aster
*Aster oolentangiensis****	Asteraceae	Sky Blue Aster
Aster racemosus Elliott.	Asteraceae	Small-headed aster
*Aster turbinellus****	Asteraceae	Prairie aster
*Astragalus crassicarpus ****	Fabaceae	Ground Plum
*Avena sativa ****	Gramineae	Oats
Azolla mexicana Presl	Salviniaceae	Mosquito fern
*Baptisia alba ****	Fabaceae	White Wild Indigo
Baptisia lactea (Raf.) Thieret	Fabaceae	White wild indigo
*Baptisia tinctoria ****	Leguminosae	Wild Indigo
*Belamcanda chinensis (L.) DC.**	Iridaceae	Blackberry lily
*Berberis thunbergii****	Berberidaceae	Japanese barberry
*Berteroa incana (L.) DC****	Cruciferae	Hoary alyssum
Betula nigra L.	Betulaceae	River birch
Bidens bipinnata L.	Asteraceae	Spanish needles
Bidens cernua L.	Asteraceae	Stick-tight
Bidens comosa (Gray) Wiegand.	Asteraceae	Straw-stem beggarstick
Bidens connata Muhl. Willd.	Asteraceae	Purple-stem beggarticks
Bidens frondosa L.	Asteraceae	Devil's beggarticks
Bidens laevis (L.) BSP.	Asteraceae	Bur marigold
Bidens polylepis S.F. Blake	Asteraceae	Long-bracted tickseed
Bidens vulgata Greene.	Asteraceae	Tall beggars tick
Boehmeria cylindrica (L.) Sw.	Urticaceae	Bog-hemp
Boltonia asteroides (L.) L. Her.	Asteraceae	False starwort
Botrychium dissectum Sprengel var. obliquum Clute	Ophioglossaceae	Grape fern
Botrychium virginianum (L.) Sw.	Ophioglossaceae	Rattlesnake fern
Brassica nigra L.	Brassicaceae	Black mustard
Cacalia suaveolens L.	Asteraceae	Indian plantain
Calamagrostis canadensis (Michx.) Nutt.	Poaceae	Blue-joint
Callitriche heterophylla Pursh.	Callitrichaceae	Water starwort
Callitriche verna L.	Callitrichaceae	Vernal water starwort
Caltha palustris L.	Ranunculaceae	Marsh marigold
Calylophus serrulatus (Nutt.) Raven	Onagraceae	Plains yellow primrose
Campanula americana L.	Campanulaceae	Tall bellflower
*Campanula rapunculoides****	Campanuloideae	Creeping bellflower
*Campanula rotundifolia****	Campanulaceae	Harebell
*Campsis radicans (L.) Seem.**	Bignoniaceae	Trumpet flower
Cannabis sativa L.	Cannabaceae	Cannabis
Capsella bursa-pastoris (L.) Medic.	Brassicaceae	Shepherd's purse

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Cardamine hirsuta L.	Brassicaceae	Bitter Cress (Hairy bitter cress)
Cardamine pennsylvanica Muhl.	Brassicaceae	Bitter cress
*Carduss nutans ****	Compositae	Musk Thistle
*Carduus nutans****	Compositae	Musk thistle
Carex alopecoidea Tuckerm.	Cyperaceae	Foxtail sedge
Carex amphibola Steud. var. turgida Fern.	Cyperaceae	Gray sedge
Carex bebbii Olney	Cyperaceae	Bebb's sedge
Carex bicknellii Britt.	Cyperaceae	Bicknell's sedge
Carex brevior (Dew.) Mackens.	Cyperaceae	Brevior's sedge
Carex brunnescens (Pers.) Poir.	Cyperaceae	Sedge (Brownish Sedge)
Carex comosa f. boott.	Cyperaceae	Sedge (Bristly Sedge)
Carex conjuncta E. Boott.	Cyperaceae	Soft fox sedge
Carex cristatella Britt.	Cyperaceae	Crested sedge
Carex crus-corvi Shuttlew Kunze.	Cyperaceae	Raven's foot sedge
Carex echinata Murray	Cyperaceae	Sedge (Prickly Sedge)
Carex emoryi Dew.	Cyperaceae	Emory's sedge
Carex frankii Kunth	Cyperaceae	Frank's sedge
Carex granularis Muhl. ex Willd.	Cyperaceae	Meadow sedge
Carex grayi Carey.	Cyperaceae	Gray's sedge
Carex haydenii Dew.	Cyperaceae	Hayden's sedge
Carex hyalinolepis Steud.	Cyperaceae	Hart Wright's sedge
Carex hystericina Muhl.	Cyperaceae	Bottlebrush sedge
Carex lacustris Willd.	Cyperaceae	Lake sedge
Carex laeviconica Dewey.	Cyperaceae	Sedge (Long-toothed Lake Sedge)
Carex lanuginosa Michx.	Cyperaceae	Woolly sedge
Carex lasiocarpa Ehrh.	Cyperaceae	Wire sedge
Carex lupulina Willd.	Cyperaceae	Hop sedge
Carex lurida Wahl.	Cyperaceae	Sallow sedge
Carex muskingumensis Schwein.	Cyperaceae	Muskingum sedge
Carex normalis Mackenz.	Cyperaceae	Sedge (Greater Straw Sedge)
Carex projecta Mack.	Cyperaceae	Necklace sedge
Carex retrorsa Schwein.	Cyperaceae	Retrorse sedge
Carex rosea Schk.	Cyperaceae	Sedge (Rosy Sedge)
Carex rostrata Stokes.	Cyperaceae	Beaked sedge
Carex scoparia Schkuhr ex Willd.	Cyperaceae	Pointed broom sedge
Carex shortinana Dew.	Cyperaceae	Short's sedge
Carex squarrosa L.	Cyperaceae	Squarrose sedge
Carex stipata Muhl.	Cyperaceae	Sedge (Common Fox Sedge)
Carex stricta Lam.	Cyperaceae	Tussock sedge
Carex tenera Dewey	Cyperaceae	Slender sedge

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Carex tribuloides Wahl.	Cyperaceae	Blunt broom sedge
Carex trichocarpa Muhl.	Cyperaceae	Sedge (Hariy Fruit Sedge)
Carex tuckermanii F. Boott.	Cyperaceae	Tuckerman's sedge
Carex typhina Michx.	Cyperaceae	Cattail sedge
Carex vulpinoidea Michx.	Cyperaceae	Fox sedge
*Cariganum aborescens****	Ulmaceae	Siberian Elm
Carya cordiformis (Wang.) K. Koch	Juglandaceae	Bitternut hickory
Carya illinoensis (Wang.) K. Koch	Juglandaceae	Pecan
Carya laciniosa (Michx.) Loud.	Juglandaceae	Shellbark hickory
Carya ovata (Mill.) K. Koch.	Juglandaceae	Shagbark hickory
Carya tomentosa Nutt.	Juglandaceae	Mockernut hickory
*Catalpa speciosa Warder**	Bignoniaceae	Northern catalpa
Celtis laevigata Willd.	Ulmaceae	Sugarberry
Celtis occidentalis L.	Ulmaceae	Hackberry
Celtis tenuifolia Nutt.	Ulmaceae	Dwarfhackberry
Cenchrus longispinus (Hack.) Fern.	Poaceae	Sand bur
Centaurea maculosa,***	Asteraceae	Spotted knapweed
Cephalanthus occidentalis L.	Rubiaceae	Buttonbush
Cerastium vulgatum L.	Caryophyllaceae	Chickweed
Ceratophyllum demersum L.	Ceratophyllaceae	Coontail
Ceratophyllum echinatum Gray	Ceratophyllaceae	Coontail (Prickly Hornwort)
Cercis canadensis L.	Fabaceae	Redbud
Chaerophyllum procumbens (L.) Crantz	Apiaceae	Spreading chervil
Chamaecrista fasciculata Michx.	Fabaceae	Partridge pea
Chasmanthium latifolium (Michx.) Yates.	Poaceae	Wild oats
*Chelone glabra L.****	Scrophulariaceae	Turtlehead
Chelone obliqua L.	Scrophulariaceae	Rose turtlehead
*Chenopodium album L.**	Chenopodiaceae	Pigweed, Lamb's-quarters
*Chrysanthemum leucantheumum****	Compositae	Ox-eye daisy
Chrysopsis graminifolia (Michx.) Elliot var. latifolia Fern.	Asteraceae	Grass-leaved golden aster
*Cichorium intybus****	Compositae	Chicory
Cicuta bulbifera L.	Apiaceae	Water hemlock
Cicuta maculata L.	Apiaceae	Spotted cowbane
Cinna arundinacea L.	Poaceae	Wood reed grass
Circaea lutetiana L.	Onagraceae	Enchanter's nightshade
*Cirsium arvense (L.) Scop.**	Asteraceae	Canada thistle
*Cirsium discolor (Muhl.) Spreng.****	Asteraceae	Field thistle
*Cirsium vulgare (Savi) Tenore.**	Asteraceae	Bull thistle
*Claytonia virginica****	Portulacaceae	Spring Beauty

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Commelina communis L.	Commelinaceae	Asiatic dayflower
Commelina diffusa Burman	Commelinaceae	Creeping dayflower
*Convolvulus arvensis L.**	Convolvulaceae	American bindweed
Conyza canadensis (L.) Cronq.	Asteraceae	Horseweed
*Coreopsis palmate****	Compositae	Stiff Coreopsis
Coreopsis tinctoria Nutt.	Asteraceae	Golden coreopsis
Cornus amomum Mill.	Cornaceae	Pale dogwood
Cornus drummondii Meyer	Cornaceae	Rough-leaved dogwood
Cornus florida L.	Cornaceae	Flowering dogwood
Cornus racemosa Lam.	Cornaceae	Northern swamp dogwood
Cornus rugosa Lam.	Cornaceae	Round-leaved dogwood
Cornus stolonifera Michx.	Cornaceae	Red-osier dogwood
Coronilla varia L.,***	Fabaceae	Crown Vetch
Corylus americana Walter.	Betulaceae	Hazelnut
*Crataegus (L.)****	Rosaceae	Hawthorn
Crataegus punctata Jacq.	Rosaceae	Dotted hawthorne
Cryptotaenia canadensis (L.) DC.	Apiaceae	Honewort
Cucurbita foetidissima HBK	Curcurbitaceae	Wild pumpkin
Cuscuta cephalanthi Engelm.	Cuscutaceae	Buttonbush dodder
Cuscuta compacta A.L. Juss.	Cuscutaceae	Dodder (Compact Dodder)
Cuscuta cuspidata Engelm.	Cuscutaceae	Dodder (Cusp Dodder)
Cuscuta glomerata Choisy.	Cuscutaceae	Rope dodder
Cuscuta gronovii Willd.	Cuscutaceae	Common dodder
Cuscuta polygonorum Engelm.	Cuscutaceae	Smartweed-dodder
Cyperus acuminatus Torr. & Hook	Cyperaceae	Taper-leaf sedge
Cyperus bipartitus Torr.	Cyperaceae	Brook sedge
Cyperus diandrus Torr.	Cyperaceae	Low cyperus
Cyperus erythrorhizos Muhl.	Cyperaceae	Red-rooted sedge
*Cyperus esculentus L.**	Cyperaceae	Nutsedge
Cyperus odoratus L.	Cyperaceae	Coarse cyperus
Cyperus squarrosus L.	Cyperaceae	Awned cyperus
Cyperus strigosus L.	Cyperaceae	Straw-colored cyperus
Cypripedium reginae Walter	Orchidaceae	Showy lady's slipper
Cystopteris bulbifera (L.)Bernh.	Polypodiaceae	Bulbet-bladder fern
*Dalea candida ****	Fabaceae	White Prairie Clover
*Dalea purpurea****	Fabaceae	Purple prairie clover
*Dancus carota ****	Umbelliferae	Wild Carrot
*Datura stramonium****	Solanaceae	Jimsonweed
*Delphinium carolinianum****	Ranunculaceaes	Prairie larkspur
*Delphinium tricorne****	Ranunculaceae	Dwarf larkspur

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Desmanthus illinoensis (Michx.) MacM.	Mimosaceae	Prairietick-trefoil
Desmodium canadense (L.) DC.	Fabaceae	Showy Tick Trefoil
Desmodium glutinosum (Muhl.) Wood.	Fabaceae	Cluster-leaftick trefoil
*Dicentra cucullaria****	Papveraceae	Dutchman's breeches
*Digitaria sanguinalis (L.) Scop.**	Poaceae	Crab grass
Dioscorea villosa L.	Dioscoreaeceae	Yam
Diospyros virginiana L.	Ebenaceae	Persimmon
Dodecatheon meadia L.	Primulaceae	Shooting star
Dryopteris cristata (L.) Gray	Polypodiaceae	Crested wood fern
Dryopteris intermedia (Muhl.) A. Gray	Polypodiaceae	Fancy wood fern
Dulichium arundinaceum (L.) Britt.	Cyperaceae	Three-way sedge
Echinochloa crusgalli (L.) Beauv.	Poaceae	Barnyard grass
Echinochloa muricata (Beauv.) Fern.	Poaceae	Barnyard grass
Echinochloa walteri (Pursh) Heller	Poaceae	Swamp barnyard grass
Echinocystis lobata (Michx.) T. & G.	Curcurbitaceae	Prickly cucumber
Echinodorus berteroi (Sprengel) Fassett	Alismataceae	Creeping burhead
Echinodorus Corddifolius (L.) Griseb.	Alismataceae	Burhead
Eclipta prostrata L.	Asteraceae	Yerba de tajo
Eleocharis acicularis (L.) Roem. & Schultes	Cyperaceae	Needle spikerush
Eleocharis compressa Sullivant	Cyperaceae	Flatstem spikerush
Eleocharis erythropoda Steud.	Cyperaceae	Bald spikerush
Eleocharis ovata (Roth) R. & S.	Cyperaceae	Oval Spikerush
Eleocharis palustris (L.) Roem. & Schultes	Cyperaceae	Marsh spikerush
Eleocharis quadrangulata (Michx.) Roem. & Schultes	Cyperaceae	Square-stemmed spikerush
Elodea canadensis Michx	Hydrophyllaceae	Common water weed
Elodea nuttallii (Planch.) St. John	Hydrophyllaceae	Water weed
Elymus canadensis L.	Poaceae	Canada wild rye
Elymus virginicus L.	Poaceae	Virginiana wild rye
Epilobium coloratum Biehler.	Onagraceae	Cinnamon willow-herb
Equisetum arvense L.	Equisataceae	Common horsetail
Equisetum fluviatile L.	Equisataceae	Water horsetail
Equisetum hyemale L. var. affine (Engelm.)	Equisataceae	Scouring rush
Equisetum laevigatum A.Br.	Equisataceae	Smooth scouring rush
Eragrostis frankii C.A. Mey	Poaceae	Sandbar lovegrass
Eragrostis hypnoides (Lam.) BSP.	Poaceae	Creeping lovegrass
Eragrostis pectinacea (Michx.) Ness.	Poaceae	Small lovegrass
Eragrostis spectabilis (Pursh) Seud.	Poaceae	Purple lovegrass
Erechtites hieracifolia (L.) Raf.	Asteraceae	Fireweed
Erigeron annuus (L.) Pers.	Asteraceae	Daisy fleabane

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Erigeron philadelphicus L.	Asteraceae	Fleabane
Erigeron pulchellus Michx.	Asteraceae	Robin's plantain
Erigeron strigosus Muhl.	Asteraceae	Rough fleabane
Erythronium albidum Nutt.	Liliaceae	White dog-tooth violet
Euonymus atropurpureus Jacq.	Celastraceae	Wahoo
Eupatorium coelestinum L.	Asteraceae	Mist flower
Eupatorium maculatum L.	Asteraceae	Joe-pye-weed
Eupatorium perfoliatum L.	Asteraceae	Boneset
Eupatorium purpureum L.	Asteraceae	Purple joe-pye-weed
Eupatorium rugosum Houttuyn.	Asteraceae	White snake root
Eupatorium serotinum Michx.	Asteraceae	Late boneset
*Euphorbia corollata****	Euphorbiaceae	Flowering spurge
*Euphorbia cyparissias****	Euphorbiaceae	Cypress spurge
Euphorbia dentata Michx.	Euphorbiaceae	Toothed spurge
Euphorbia esula,***	Euphorbiaceae	Leafy spurge
Euphorbia humistrata (Engelm.)	Euphorbiaceae	Spurge (Sandmat Spurge)
Euphorbia maculata L.	Euphorbiaceae	Spotted spurge
Euphorbia serpens HBK.	Euphorbiaceae	Round-leaved spurge
Euphorbia vermiculata Raf.	Euphorbiaceae	Hairy spurge
*Festuca elatior****	Gramineae	Meadow fescue
Forestiera acuminata (Michx.) Poiret.	Oleaceae	Swamp privet
Fragaria virginiana Duchn.	Rosaceae	Wild strawberry
*Fraxinus americana ****	Oleaceae	White Ash
Fraxinus nigra Marsh.	Oleaceae	Black Ash
Fraxinus pennsylvanica Marsh.	Oleaceae	Green ash
Galinsoga quadriradiata Ruiz & Pavon	Asteraceae	Fringed quickweed
Galium aparine L.	Rubiaceae	Spring-cleavers
*Galium boreale ****	Rubiaceae	Northern Bedstraw
Galium concinnum T. & G.	Rubiaceae	Elegant bedstraw
Galium obtusum bigel.	Rubiaceae	Bluntleaf bedstraw
*Galium tinctorium L.****	Rubiaceae	Stiff bedstraw
Galium trifidum L.	Rubiaceae	Northern three-lobed bedstraw
Gaura biennis D.	Onagraceae	Biennial gaura
Geranium maculatum L.	Geraniaceae	Wild geranium
Geum canadense Jacq.	Rosaceae	White avens
Geum laciniatum Murr.	Rosaceae	Rough avens
*Geum triflorum****	Rosaceae	Prairie smoke
Glechoma hederacea L.	Lamiaceae	Ground ivy
Gleditsia triacanthos L.	Fabaceae	Honey locust
Glyceria borealis Nash.	Poaceae	Northern manna grass

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Glyceria grandis S. Wats.	Poaceae	Reed meadow grass
Glyceria striata (Lam.) A. Hitchc.	Poaceae	Fowl meadow grass
Gnaphalium uliginosum L.	Asteraceae	Low cudweed
*Gnaphlium obtusifolium****	Compositae	Sweet Everlasting
Gratiola neglecta Torr.	Scrophulariaceae	Hedge hyssop
Gymnocladus dioica (L.) K. Koch	Fabaceae	Kentucky coffee tree
Habenaria leucophaea mutt.) A. Gray	Orchidaceae	Prairie fringed orchid
Habenaria psycodes (L.) Sprengel.	Orchidaceae	Purple fringed orchid
Habenaria viridis (L.) Br. var. bracteata (Muhl.) A. Gray	Orchidaceae	Frog orchid
Hackelia virginiana (L.) Johnston.	Boraginaceae	Stickseed
Helenium autumnale L.	Asteraceae	Sneezeweed
Helianthus grosseserratus Martens	Asteraceae	Sawtooth sunflower
*Helianthus pauciflorus****	Compositae	Stiff Sunflower
Heliopsis helianthoides (L.) Sweet.	Asteraceae	Sweet ox-eye
*Heliotropium indicum L.**	Boraginaceae	Turnsole
*Hemerocallis fulva ****	Liliaceae	Day Lilly
Hemicarpha micrantha (Vahl) Pax	Cyperaceae	Dwarf bulrush
Hepatica acutiloba DC.	Ranunculaceae	Sharp-lobed lobelia
Heracleum lanatum Michx.	Apiaceae	Cow parsnip
Heterantheria limosa (Sw,) Willd.	Pontederiaceae	Mud plantain
Hibiscus laevis All.	Malvaceae	Smooth rosemallow
Hibiscus muscheutos L.	Malvaceae	Swamp rosemallow
*Hieracium aurantiacum****	Compositae	Orange hawkweed
*Hieracium caespitosum ****	Compositae	Yellw Hawkweed
*Houstonia caerulea****	Rubiaceae	Bluets
*Houstonia longifolia****	Rubiaceae	Long-leaved bluets
Humulus lupulus L.	Cannabaceae	Hops
Hydrophyllum virginianum L.	Hydrophyllaceae	Virginia water leaf
Hypericum boreale (Britt.) Bick.	Clusiaceae	Northern St. John's-wort
Hypericum mutilum L.	Clusiaceae	Dwarf St. John's-wort
Hypericum prolificum L.	Clusiaceae	Shrubby St. John's-wort
Hypericum punctatum L.	Clusiaceae	Spotted St. John's-wort
Hypericum pyramidatum Ait.	Clusiaceae	Great St. John's-wort
Hypericum sphaerocarpum Michx.	Clusiaceae	Roundfruit St. John's wort
Hypoxis hirsuta (L.) Cov.	Liliaceae	Yellow star grass
Ilex decidua Walt.	Aquilfoliaceae	Possum haw
*Impatiens capensis Meerb.****	Balsaminaceae	Orange jewelweed
Impatiens pallida Nutt.	Balsaminaceae	Pale touch-me-not
Ipomoea lacunosa L.	Convolvulaceae	White morning glory

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
*Iris versicolor***	Iridaceae	Large blueflag
Iris virginica L. var. shrevei (Small) E. Anders.	Iridaceae	Blue flag
Isoetes melanpoda Gay and Dur.	Isoetaceae	Quillwort
Iva annua l.	Asteraceae	Marsh elder
Juglans cinerea L.	Juglandaceae	Butternut
Juglans nigra L.	Juglandaceae	Black walnut
Juncus acuminatus Michx.	Juncaceae	Knotty-leaved rush
Juncus effusus L.	Juncaceae	Soft rush
Juncus nodosus L.	Juncaceae	Joint rush
Juncus tenuis Willd. var. dudleyi (Wieg.)	Juncaceae	Path rush
Juncus torreyi Cov.	Juncaceae	Torrey's rush
Juniperus communis L.	Cuppressaceae	Common juniper
Juniperus virginiana L.	Cuppressaceae	Red cedar
*Koeleria cristata ****	Poaceae	Junegrass
Lactuca floridana (L.) Gaertner	Asteraceae	Woodland lettuce
Lactuca saligna L.	Asteraceae	Willowleaf lettuce
Laportea canadensis (L.) Wedd.	Urticaceae	Wood nettle
Lathyrus palustris L.	Fabaceae	Marsh pea
Lathyrus venosus Muhl. var. intonsus Butters and St. John	Fabaceae	Forest pea
Leersia lenticularis Michx.	Poaceae	Catchfly grass
Leersia oryzoides (L.) Sw.	Poaceae	Rice cutgrass
Leersia virginica Willd.	Poaceae	White grass
Lemna minor L.	Lemnaceae	Lesser duckweed
Lemna obscura (Austin) Daubs	Lemnaceae	Duckweed (Little Duckweed)
Lemna perpusilla Torr.	Lemnaceae	Duckweed (Least Duckweed)
Lemna trinervis (Austin) Small	Lemnaceae	Duckweed
Lemna trisulca L.	Lemnaceae	Star duckweed
Lemna valdiviana Phil.	Lemnaceae	Duckweed
*Leonurus cardiaca L.**	Lamiaceae	Motherwort
*Leonurus marrubiastrum L.**	Lamiaceae	Motherwort
Leptochloa filiformis P. (Lam.) Beauv.	Poaceae	Red sprangletop
*Lespedeza capitata****	Leguminosae	Bush Clover
*Liatris aspera ****	Compositae	Rough Blazing Star
*Liatris cylindracea****	Asteraceae	Cylindric blazing star
*Liatris ligulistlis****	Asteraceae	North plains blazing star
*Liatris pycnostachya****	Asteraceae	Prairie blazing star
Lilium canadense L.	Liliaceae	Wild yellow lily
Lilium michiganense Farw.	Liliaceae	Michigan lily
*Lindaria vulgaris ****	Scrophulariaceae	Butter and Eggs

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Lindernia dubia (L.) Pennell.	Scrophulariaceae	False pimpernel
Liquidambar styraciflua L.	Hamamelidaceae	Sweet gum
*Lithospermum canenscens****	Boraginaceae	Hoary Puccoon
*Lithospermum croceum****	Boraginaceae	Hairy puccoon
Lobelia cardinalis L.	Campanulaceae	Cardinal flower
Lobelia siphilitica L.	Campanulaceae	Great lobelia
Lobelia spicata Lam.	Campanulaceae	Pale-spike lobelia
Lonicera dioca L.	Caprifoliaceae	Wild honeysuckle
*Lonicera tartarica. and others**	Caprifoliaceae	Bush honeysuckles (Tartarian Honeysuckle)
*Lonicera x bella Zabel.**	Caprifoliaceae	Honeysuckle (White-bell Honeysuckle)
*Lotus corniculatus****	Leguminosae	Bird's foot trefoil
Ludwigia alternifolia L.	Onagraceae	Seedbox
Ludwigia peploides (HBK) Raven	Onagraceae	Floating primrose willow
Ludwigia polycarpa Short & Peter	Onagraceae	Water primrose
*Lupinus perennis ****	Leguminosae	Wild Lupine
*Lychnis alba****	Caryophyllaceae	Evening lychnis
Lycopersicon esculentum Miller	Solanaceae	Tomato
Lycopus americanus Muhl.	Lamiaceae	American bugleweed
Lycopus rubellus Moench	Lamiaceae	Stalked water horehound
Lycopus uniflorus Michx.	Lamiaceae	Northern bugleweed
Lycopus virginicus L.	Lamiaceae	Water horehound
Lysimachia ciliata L.	Primulaceae	Fringed loosestrife
Lysimachia hybrida Michx.	Primulaceae	Mississippi Valley loosestrife
Lysimachia lanceolata Walt.	Primulaceae	Lance-leaved loosestrife
*Lysimachia nummularia L.**	Primulaceae	Moneywort
Lysimachia terrestris (L.) BSP.	Primulaceae	Swamp candles
Lysimachia thyrsiflora L.	Primulaceae	Swamp loosestrife
Lythrum alatum Pursh.	Lythraceae	Winged loosestrife
*Lythrum salicaria L.**	Lythraceae	Purple loosestrife
Maianthemum canadense Desf	Liliaceae	Wild lily of the valley
Matteuccia struthiopteris (L.) Todaro	Polypodiaceae	Ostrich fern
*Medicago lupulina****	Leguminosae	Black medick
*Medicago sativa****	Leguminosae	Alfalfa
*Melilotus alba ****	Leguminosae	White Sweet Clover
*Melilotus officinalis ****	Leguminosae	Yellow Sweet Clover
Menispermum canadense L.	Menisperimaceae	Moonseed
Mentha arvensis L.	Lamiaceae F	Field mint
Mimulus alatus Ait.	Scrophulariaceae	Sharp-winged monkey flower
Mimulus ringens L.	Scrophulariaceae	Square-stemmed monkey flower

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Mitella diphylla L.	Saxifragaceae	Two-leaved miterwort
Mollugo verticillata L.	Molluginaceae	Carpetweed
*Monarda fistulosa ****	Lamiaceae	Wild Bergamot
*Monarda punctata****	Labiatae	Horse-mint
*Monotropa uniflora ****	Labiatae	Indian Pipe
*Morus alba L.**	Moraceae	White mulberry
Morus rubra L.	Moraceae	Red mulberry
Muhlenbergia frondosa (Poir.) Fernald	Poaceae	Satin grass
Muhlenbergia racemosa (Michx.) BSP	Poaceae	Green muhly
Muhlenbergia schreberi J.F. Gemelin	Poaceae	Nimbleweed
Myriophyllum heterophyllum Michx.	Haloragaceae	Milfoil (Two-leaf Milfoil)
Myriophyllum pinnatum (Walt.) BSP.	Haloragaceae	Milfoil (Water Milfoil)
*Myriophyllum spicatum L. var. exalbescens (Fern.) Jepson**	Haloragaceae	Eurasian milfoil
Myriophyllum verticillatum L.	Haloragaceae	Whorled milfoil
Najas flexilis (Willd.) Rostk. & Schmidt	Najadaceae	Northern water nymph
Najas guadalupensis (Spreng.) Morong	Najadaceae	Southern water nymph
*Najas minor All.**	Najadaceae	Eutrophic water nymph
Nelumbo lutea (Willd.) Pers.	Nelumbonaceae	Water lotus
Nuphar advena Aiton	Nymphaceae	Spatter dock
*Nymphaea odorata Aiton****	Nymphaceae	Fragrant water lily
Nyssa aquatica (L.)	Cornaceae	Water tupelo
*Oenothera biennis L.****	Onagraceae	Evening primrose
*Oenothera rhombipetala****	Onagraceae	Longspike evening primrose
Onoclea sensibilis L.	Polypodiaceae	Sensitive fern
*Opuntia humifusa****	Cactaceae	Prickly pear cactus
Osmorhiza claytonii (Michx.)	Apiaceae	Bland sweet cicely
Osmunda cinnamonea L.	Osmundaceae	Cinnamon fern
Osmunda claytoniana L.	Osmundaceae	Interrupted fern
Osmunda regalis L.	Osmundaceae	Royal fern
Oxalis stricta L.	Oxalaceae	Wood-sorrel
Panicum capillare L.	Poaceae	Old witch grass
Panicum clandestinum L.	Poaceae	Deer-tongue grass
Panicum dichotomiflorum Michx.	Poaceae	Fall panic grass
Panicum lanigunosum Ell.	Poaceae	Wooly panicum
Panicum rigidulum Bosc.	Poaceae	Red-top panicum
Panicum virgatum L.	Poaceae	Switchgrass
Parnassia glauca Raf.	Saxifragaceae	Grass of parnassus
Parthenium integrifolium L.	Asteraceae	American fever-few
Parthenocissus quinquefolia (L.) Planch	Vitaceae	Virginia creeper

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Parthenocissus vitacea (Knerr.) A. Hitchc.	Vitaceae	Grape woodvine
Paspalum fluitans (Elliott) Kunth.	Poaceae	Bead grass
Pastinaca sativa ***	Apiaceae	Wild Parsnip
Pedicularis canadensis L.	Scrophulariaceae	Wood betony
Peltandra virginica (L.) schott & Endl.	Araceae	Arrow arum
*Penstemon digitalis****	Scrophulariaceae	Smooth Beardtongue or Foxglove
*Penstemon grandiflorus****	Scrophulariaceae	Large-flowered beardstongue
*Penstemon hirsutus****	Scrophulariaceae	Hairy beardstongue
Penthorum sedoides L.	Saxifragaceae	Ditch-stonecrop
*Phalaris arundinacea L.**	Poaceae	Reed canary grass
*Phleum pratense****	Gramineae	Timothy
Phlox divaricata L.	Polemoniaceae	Forest phlox
Phlox pilosa L.	Polemoniaceae	Downy phlox
Phragmites australis (Cav.) Trin.	Poaceae	Common reed
Phyla lanceolata Michx. (Green)	Verbenaceae	Fog fruit
*Physalis heterophylla Nees***.	Solanaceae	Clammy ground cherry
Physalis longifolia Nutt.	Solanaceae	Long-leaved ground cherry
*Physalis verginiana ****	Solanaceae	Swamp Milkweed
*Physostegia virginiana (L.) Benth. **	Lamiaceae	False dragonhead
Phytolacca americana L.	Phtolaccaceae	Pokeweed
*Picea abies****	Pinaceae	Norway spruce
Pilea pumila L. Gray.	Urticaceae	Clearweed
*Pinus banksiana****	Pinaceae	Jack pine
*Pinus resinosa****	Pinaceae	Norway pine (ed pine)
*Pinus strobus L. ****	Pinaceae	White Pine
Pinus sylvestris L.	Pinaceae	Scotch pine
*Plantago major L.**	Plantaginaceae	Common plantain
Plantago rugelii Dene.	Plantaginaceae	Red-stemmed plantain
Platanus occidentalis L.	Plantanaceae	Sycamore
Poa pratensis L.	Poaceae	Kentucky bluegrass
Podophyllum peltatum L.	Berberidaceae	May apple
*Polanisia dodecandra****	Capparaceae	Clammy-weed
Polygala sanguinea L.	Polygonaceae	Blood polygala
Polygonum amphibium L.	Polygonaceae	Water smartweed
Polygonum aviculare L.	Polygonaceae	Water smartweed (Prostrate Knotweed)
*Polygonum hydropiper L.****	Polygonaceae	Common smartweed
Polygonum hydropiperoides Michx.	Polygonaceae	Wild water pepper
Polygonum lapathifolium L.	Polygonaceae	Nodding smartweed
Polygonum pensylvanicum L.	Polygonaceae	Pinkweed

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Polygonum persicaria L.	Polygonaceae	Lady's thumb
Polygonum punctatum Ell.	Polygonaceae	Water smartweed
Polygonum ramosissimum Michx.	Polygonaceae	Bushy knotweed
Polygonum scandens L.	Polygonaceae	False buckwheat
Polygonum virginianum L.	Polygonaceae	Jumpseed
Pontederia cordata L.	Pontederiaceae	Pickerelweed
Populus deltoides Marsh.	Salicaceae	Cottonwood
*Populus grandidentata****	Salicaceae	Big-toothed Aspen
*Populus tremuloides ****	Salicaceae	Quaking Aspen
Portulaca oleracea L.	Portulaceae	Common purslane
Potamogeton amplifolius Tuckerm.	Potamogetonaceae	Bigleaf pondweed
*Potamogeton crispus L.**	Potamogetonaceae	Curly-leaved pondweed
Potamogeton diversifolius L.	Potamogetonaceae	Snailseed pondweed
Potamogeton epihydrus Raf.	Potamogetonaceae	Ribbon-flowered pondweed
Potamogeton foliosus Raf.	Potamogetonaceae	Leafy pondweed
Potamogeton illinoensis Morong	Potamogetonaceae	Illinois pondweed
Potamogeton natans L.	Potamogetonaceae	Floating pondweed
Potamogeton nodosus Poir.	Potamogetonaceae	Long-leaved pondweed
Potamogeton pectinatus L.	Potamogetonaceae	Sago pondweed
Potamogeton pulcher Tuckerm.	Potamogetonaceae	Spotted pondweed
Potamogeton pusillus L.	Potamogetonaceae	Slender pondweed
Potamogeton richardsonii (Benn.) Rydb.	Potamogetonaceae	Red-head pondweed
Potamogeton strictifolius Benn.	Potamogetonaceae	Straight-leaved pondweed
Potamogeton zosteriformis Fern.	Potamogetonaceae	Flat-stem pondweed
Potentilla norvegica L.	Rosaceae	Strawberry weed
*Potentilla recta L.**	Rosaceae	Rough-fruited cinquefoil
Potentilla rivalis Nutt.	Rosaceae	Brook cinquefoil
Proserpinaca palustris L.	Halogaraceae	Mermaid-weed
Prunella vulgaris L.	Lamiaceae	Self heal
Prunus americana Marsh.	Rosaceae	Wild Plum
Prunus serotina Ehrh.	Rosaceae	Black cherry
Prunus virginiana L.	Rosaceae	Choke-cherry
*Quercus alba****	Fagaceae	White Oak
Quercus bicolor Willd.	Fagaceae	Swamp white oak
Quercus imbricaria Michx.	Fagaceae	Shingle oak
Quercus marilandica Muench.	Fagaceae	Blackjack oak
Quercus palustris Muench.	Fagaceae	Pin oak
Quercus prinoides Willd.	Fagaceae	Chinquapin oak
Quercus rubra L.	Fagaceae	Red oak
Quercus shumardii Buckl.	Fagaceae	Shumard oak

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Quercus stellata Wang.	Fagaceae	Sand post oak
Quercus velutina Lam.	Fagaceae	Black oak
*Ranunculus fascicularis****	Ranunculaceae	Early buttercup
Ranunculus flabellaris Raf.	Ranunculaceae	Yellow water crowfoot
Ranunculus hispidus Michx.	Ranunculaceae	Swamp buttercup
Ranunculus longirostris Godr.	Ranunculaceae	White water crowfoot
Ranunculus pensylvanicus L.	Ranunculaceae	Bristly crowfoot
*Ranunculus rhomboideus****	Ranunculaceae	Prairie buttercup
Ranunculus scleratus L.	Ranunculaceae	Cursed crowfoot
*Ranunculus septenrionalis ****	Ranunculaceae	Swamp Buttercup
Ranunculus subrigidus W. Drew	Ranunculaceae	White water crowfoot
Ratibida pinnata (Vent.) Barnh.	Asteraceae	Gray-headed coneflower
*Rhamnus cathartica L. *,***	Rhamnaceae	Common buckthorn
*Rhamnus frangula L. *,***	Rhamnaceae	Glossy buckthorn
*Rhus radicans****	Anacardiaaceae	Poison Ivy
*Rhus typhina L.****	Anacardiaaceae	Staghorn Sumac
Ribes americanum Mill.	Saxifragaceae	Wild black currant
Ribes hirtellum Michx.	Saxifragaceae	Gooseberry (Smooth Gooseberry)
Ribes missouriense Nutt.	Saxifragaceae	Missouri gooseberry
Riccia fluitans	Ricciaceae	Aquatic liverwort
Ricciocarpus natans	Ricciaceae	Common ricciocarpus
*Robinia pseudo-acacia L.**	Fabaceae	Black locust
*Rorripa nasturtium-aquaticum (L.) Hayek**	Brassicaceae	Water cress
Rorripa palustris (L.) Bess.	Brassicaceae	Marsh cress
Rorripa sessiliflora (Nutt.) Hitchc.	Brassicaceae	Sessile-flowered cress
Rosa blanda Ait.	Rosaceae	Early wild rose
*Rosa Carolina****	Rosaceae	Pasture Rose
Rosa setigera Michx.	Rosaceae	Prairie rose
Rosa suffata	Rosaceae	Dwarf prairie rose
Rubus allegheniensis Porter.	Rosaceae	Common blackberrry
Rubus flagellaris L.	Rosaceae	Northern dewberry
Rubus occidentalis L.	Rosaceae	Black raspberry
Rubus strigosus Michx.	Rosaceae	Red raspberry
Rudbeckia hirta L.	Asteraceae	Black-eyed susan
Rudbeckia laciniata L.	Asteraceae	Cutleaf coneflower
Rudbeckia triloba L.	Asteraceae	Three-lobed coneflower
Ruellia humilis Nutt.	Acanthaceae	Fringeleaf ruellia
Ruellia strepens L.	Acanthaceae	False petunia
*Rumex acetosella L.**	Polygonaceae	Sheep sorrel
Rumex altissimus Wood.	Polygonaceae	Pale dock

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Rumex crispus L. *	Polygonaceae	Curly dock
Rumex maritimus L.	Polygonaceae	Golden dock
Rumex orbiculatus Gray	Polygonaceae	Water dock
Rumex salicifolius J.A. Weinm.	Polygonaceae	Dock (Willow Dock)
Rumex verticillatus L.	Polygonaceae	Swamp dock
Sagittaria brevirostra Mack. & Bush	Alismataceae	Short-beaked arrowhead
Sagittaria calycina Engelm.	Alismataceae	Mississippi arrowhead
Sagittaria cuneata Sheldon	Alismataceae	Northern arrowhead
Sagittaria graminea Michx.	Alismataceae	Grass-leaved arrowhead
Sagittaria latifolia Willd.	Alismataceae	Broad-leaved arrowhead
Sagittaria rigida Pursh	Alismataceae	Sessile-fruited arrowhead
Salix amygdaloides Anderss.	Salicaceae	Peach-leaved willow
Salix eriocephala Michx.	Salicaceae	Diamond willow
Salix interior Rowlee	Salicaceae	Sandbar willow
Salix nigra Marsh.	Salicaceae	Black willow
Sambucus canadensis L.	Caprifoliaceae	Elderberry
*Sambucus pubens***	Caprifoliaceae	Red Elderberry
Sanguinaria canadensls L.	Papaveraceae	Bloodroot
*Saponaria officinalis****	Caryophyllaceae	Bouncing Bet
Sassafras albidum (Nutt.) Nees.	Lauraceae	Sassafras
Saururus cernuus L.	Saururaceae	Lizard's tail
Saxifraga pensylvanica L.	Saxifragaceae	Swamp saxifrage
*Schizachyrium scoparium****	Gramineae	Little bluestem
Scirpus acutus Muhl.	Cyperaceae	Hardstem bulrush
Scirpus americanus Pers.	Cyperaceae	Olney-three square
Scirpus atrovirens Willd.	Cyperaceae	Black bulrush
Scirpus cyperinus (L.) Kunth	Cyperaceae	Woolly bulrush
Scirpus fluviatilis Torr. & Gray	Cyperaceae	River bulrush
Scirpus heterochaetus Chase	Cyperaceae	Slender bulrush
Scirpus pendulus Muhl.	Cyperaceae	Nodding bulrush
Scirpus validus Vahl.	Cyperaceae	Softstem bulrush
Scrophularia marilandica L.	Scrophulariaceae	Figwort
Scutellaria galericulata L.	Lamiaceae	Common skullcap
Scutellaria lateriflora L.	Lamiaceae	Mad-dog skullcap
*Senecio aureus****	Compositae	Golden ragwort
Senecio glabellus Poir.	Asteraceae	Yellowtop
*Senecio plattensis****	Compositae	Prairie ragwort
Setaria faberi Herrm.	Poaceae	Giant foxtail
Setaria glauca (L.) P. Beauv.	Poaceae	Yellow foxtail
Setaria viridis (L.) Beauv.	Poaceae	Green foxtail

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Sicyos angulatus L.	Curcurbitaceae	Bur cucumber
Sida spinosa L.	Malvaceae	Prickly sida
*Silene stellata****	Caryophyllaceae	Starry Campion
*Silene vulgaris****	Caryophyllaceae	Bladder campion
Silphium integrifolium	Compositae	Prairie rosinweed
*Silphium laciniatum****	Asteraceae	Compass plant
*Silphium perfoliatum****	Compositae	Cup Plant
Sisyrinchium campestre E. Bickn.	Iridaceae	Prairie blue-eyed grass
Sium suave Walt.	Apiaceae	Water parsnip
Smilax ecirrhata (Engelm.) S. Wats.	Smilacaceae	Upright carrion flower
Smilax herbacea L.	Smilacaceae	Carrion flower
Smilax hispida Muhl.	Smilacaceae	Bristly greenbrier
Solanum caroliniense L.	Solanaceae	Horsenettle
Solanum dulcamara L.	Solanaceae	Bittersweet
Solanum nigrum L.	Solanaceae	Black nightshade
Solidago canadensis L.	Asteraceae	Canada goldenrod
*Solidago gigantica****	Compositae	Smooth Goldenrod
*Solidago hispida****	Asteraceae	Hairy goldenrod
*Solidago juncea ****	Asteraceae	Early Goldenrod
*Solidago nemoralis ****	Compositae	Grey Goldenrod
*Solidago ohioensis ****	Asteraceae	Ohio Goldenrod
*Solidago speciosa ****	Asteraceae	Showy Goldenrod
*Sonchus asper****	Compositae	Spiny-leaved Sow Thistle
*Sorghastrum nutans ****	Poaceae	Indian Grass
*Specularia perfoliata ****	Campanulaceae	Venus' Looking-glass
*Spirea alba ****	Rosaceae	Meadowsweet
Staphylea trifolia L.	Staphyleaceae	Bladdernut
Stellaria aquatica (L.) Scop.	Caryophyllaceae	Giant chickweed
Stellaria media (L.) Cyrillo	Caryophyllaceae	Common chickweed
*Stipa spartea ****	Gramineae	Needle Grass
Symplocarpus foetidus (L.) Nutt.	Araceae	Skunk cabbage
*Tanacetum vulgare L.**	Asteraceae	Common tansy
Taraxacum officinale Weber.	Asteraceae	Dandelion
Taxodium distichum (L.) Rich.	Taxodiaceae	Bald cypress
*Tephrosia virginiana****	Leguminosae	Goat's rue
*Teucrium canadense L.****	Lamiaceae	American germander
Thalictrum dasycarpum Fisch. and Lall.	Ranunculaceae	Tall meadow rue
Thalictrum dioicum L.	Ranunculaceae	Early meadow rue
Thalictrum revolutum DC.	Ranunculaceae	Waxy meadow rue
Thelypteris palustris Schott.	Polypodiaceae	Marsh fern

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
Thuja occidentalis ***	Cupressaceae	White Cedar
Tilia americana L.	Tiliaceae	Basswood
Toxicodendron radicans ssp. negundo (Greene) Gillis	Anacardiaceae	Common poison ivy
Toxicodendron rydbergii (Small ex Rydb.) Greene	Anacardiaceae	Western poison ivy
*Tradescantia ohiensis****	Commelinaceae	Smooth-stemmed or Common Spiderwort
Tradescantia virginiana L.	Commelinaceae	Spiderwort
Tragopogon pratensis ***	Asteraceae	Yellow Goat's Beard
Trifolium pratense ***	Leguminosae	Red Clover
Trifolium repens ***	Leguminosae	White Clover
Trillium cernuum L.	Liliaceae	Nodding trillium
Triodanis perfoliata (L.) Nieuwl.	Campanulaceae	Spectacle-weed
Triosteum perfoliatum L.	Caprifoliaceae	Horse-gentian
Typha angustifolia L.	Typhaceae	Narrow-leaved cattail
Typha latifolia L.	Typhaceae	Common cattail
Ulmus americana L.	Ulmaceae	American elm
Ulmus parvifolia ***	Ulmaceae	Chinese Elm
*Ulmus parvifolia****	Ulmaceae	Chinese Elm
*Ulmus pumila L.**	Ulmaceae	Siberian elm
Ulmus rubra Muhl.	Ulmaceae	Red elm
*Urtica dioica L.**	Urticaceae	Stinging nettle
Utricularia vulgaris L.	Lentibulariaceae	Common bladderwort
Uvularia grandiflora J.E. Smith	Liliaceae	Bellwort
Vallisneria americana Michx.	Hydrophyllaceae	Water celery (Wild celery)
*Verbascum thapsus****	Scrophulariaceae	Common mullein
*Verbena hastata L.****	Verbenaceae	Blue vervain
*Verbena stricta****	Verbenaceae	Hoary vervain
Verbena urticifolia L.	Verbenaceae	White vervain
Verbesina alternifolia (L.) Britt.	Asteraceae	Winged-stem
Vernonia baldwini Torr.	Asteraceae	Western ironweed
Vernonia gigantea (Walter) Trel.	Asteraceae	Tall ironweed
Vernonia missurica Rat:	Asteraceae	Missouri ironweed
*Veronia fasciculate****	Compositae	Smooth Ironweed
*Veronia fasciculate****	Compositae	Smooth Ironweed
Veronica anagallis-aquatics L.	Asteraceae	Water speedwell
Veronica peregrina L.	Scrophulariaceae	Purslane-speedwell
Veronica scutellata L.	Asteraceae	Marsh speedwell
Veronicastrum virginicum (L.) Farw.	Scrophulariaceae	Culver's root
*Viburnum dentatum****	Caprifoliaceae	Arrowwood
Viburnum lentago L.	Caprifoliaceae	Nannyberry

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
*Vicia cracca****	Leguminosae	Cow vetch
*Vicia villosa****	Leguminosae	Hairy vetch
*Viola pedata****	Violaceae	Bird's foot violet
*Viola pedatifida ****	Violaceae	Prairie Violet
Viola sagittata Ait.	Violaceae	Arrow-leaved violet
Viola sororia Willd.	Violaceae	Missouri violet
Vitis aestivalis var. argentinfolia	Vitaceae	Summer grape
Vitis cinerea Engelm.	Vitaceae	Graybark grape
Vitis palmata Vahl.	Vitaceae	Red grape
Vitis riparia Michx.	Vitaceae	Riverbank grape
Vitis vulpina L.	Vitaceae	Frost grape
Wolffia columbiana Karst.	Lemnaceae	Water meal
Wolffia papulifera Thompson	Lemnaceae	Water meal
Wolffia punctata Griseb.	Lemnaceae	Dotted water meal
Wolffiella floridana (J.D. Smith) Thompson	Lemnaceae	Water meal
Woodsia obtusa (Spreng.) Torr.	Polypodiaceae	Blunt-lobed woodsia
*Xanthium strumarium L.**	Asteraceae	Common cocklebur
Xanthoxylum americanum Mill.	Rutaceae	Prickly ash
Zannichellia palustris L.	Zannichelliaceae	Horned pondweed
Zizania palustris L. var. interior Fassett	Poaceae	Wild rice
Zizia aurea (L.) W. Do J. Koch.	Apiaceae	Golden alexander
Zosterella dubia (Jacq.) Small	Pontederiaceae	Water stargrass

Appendix D: Compatibility Determinations

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.

Final compatibility determinations were signed following release of the Record of Decision and are 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

Appendix E: Applicable Laws and Executive Orders

Applicable Laws and Executive Orders

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 resourcedevelopment 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 Refuge'" 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 F: Executive Order Establishing Trempealeau Migratory Waterfowl Refuge Wisconsin

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 rfuge and breeding ground for migratory birds and other widlife;

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 secction 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 G: Distribution List

Distribution List

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

Appendix H: Bibliography

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