

# Chapter 2: Alternatives, Including the Proposed Action

## 2.1 Introduction

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

## 2.2 Development of Alternatives

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

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



*Prothonotary Warbler. USFWS*

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

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

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

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

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

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

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



*Red-winged Blackbird. USFWS*

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

## 2.3 Alternative Components Not Considered for Detailed Analysis

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

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

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

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

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

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



*Painted turtle, USFWS*

## 2.4 Alternatives Carried Forward for Detailed Analysis

### 2.4.1 Elements Common to All Alternatives

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



Coyote. USFWS

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

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

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

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

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

## 2.4.2 Alternative A: No Action (Current Direction)

### Goal 1 Landscape

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

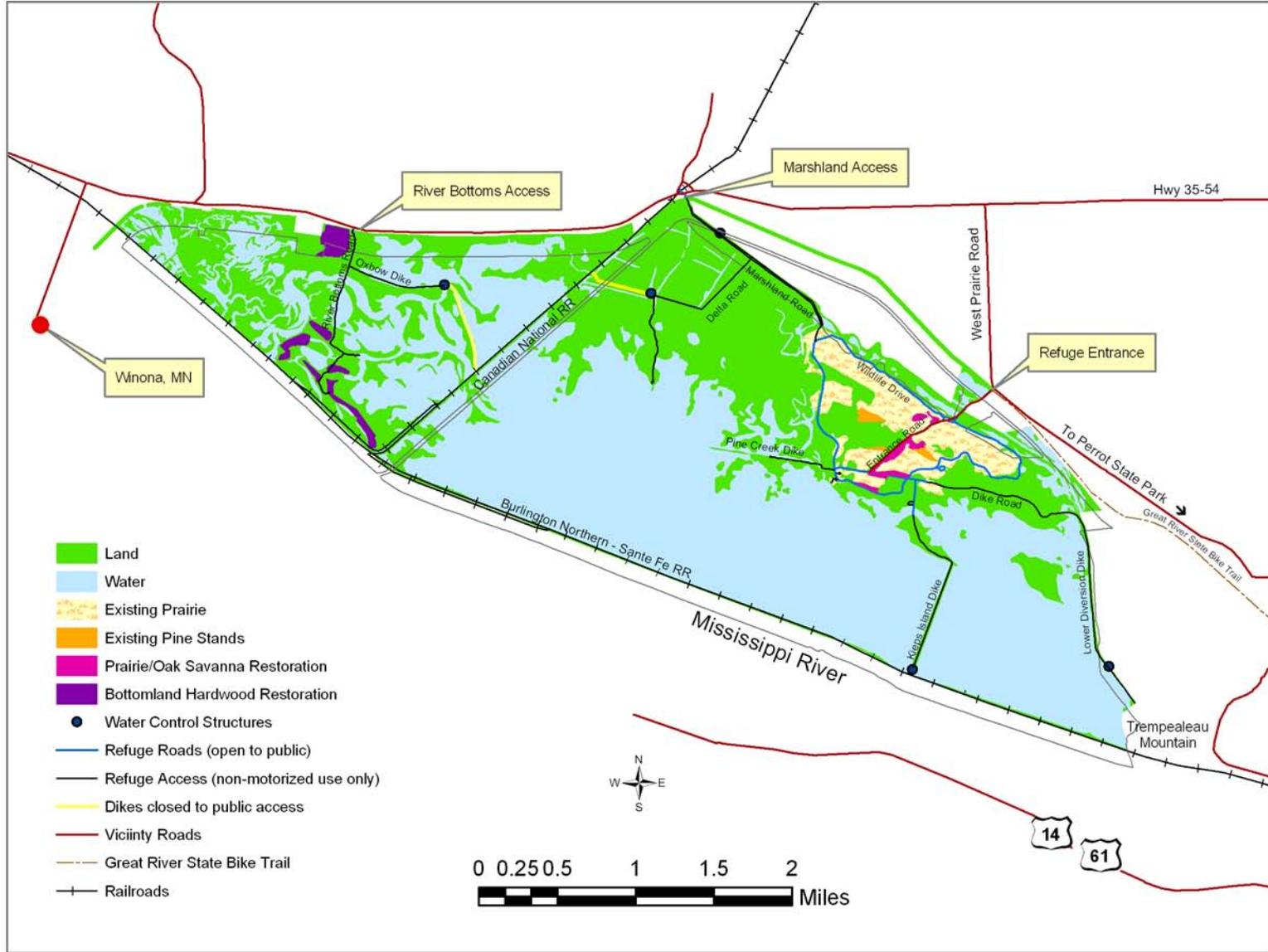
Figure 5 represents habitat management under Alternative A and Figure 6 on page 34 represents public use under this alternative.

### Objective 1.1: Land Acquisition

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

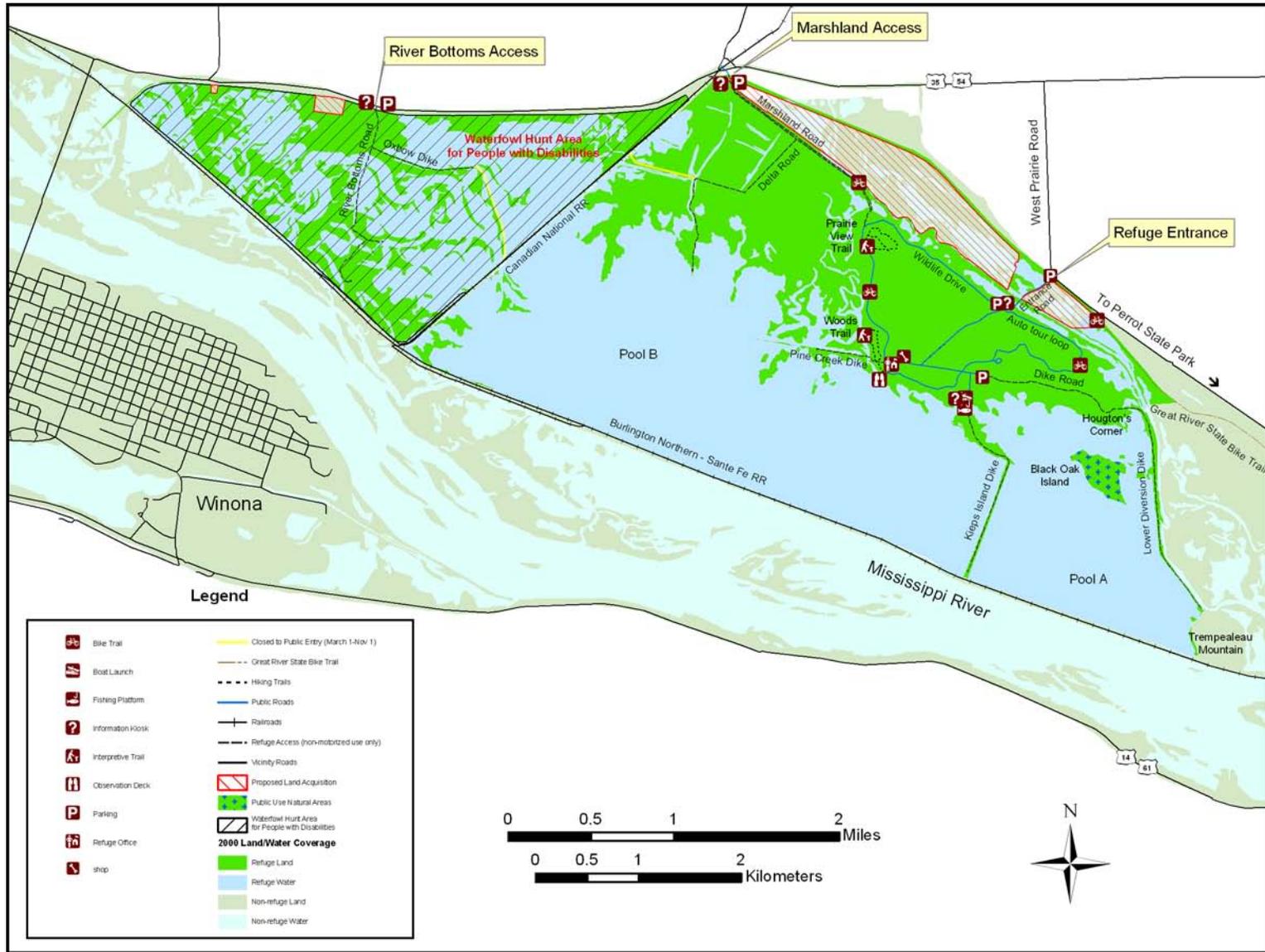
*Rationale:* Land acquisition can be a cost effective tool to ensure protection of important fish and wildlife habitat and to close gaps in the existing boundary. All of the properties in question are in the floodplain and subject to sporadic flooding. The system of dikes, constructed in the early 1900s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

**Figure 5: Alternative A (Current Management), Habitat**



**Alternative A: No Action (Current Management)**

Figure 6: Alternative A (Current Management) Public Use



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

Strategies:

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

**Objective 1.2: Refuge Boundary**

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

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

Strategies:

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

**Objective 1.3: Flood Protection**

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

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

Strategies:

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

**Objective 1.4: Natural Area Management**

Conduct yearly visits to Black Oak Island to document condition.

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

Strategies:

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

**Objective 1.5: Archeological Resources**

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

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

Strategies:

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

**Goal 2: Wildlife and Habitat**

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

**Objective 2.1: Forest Management**

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

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

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

*Strategies:*

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

**Objective 2.2: Wetland Management**

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

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

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



Great Egrets. USFWS

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

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

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

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

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

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

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

*Strategies:*

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

**Objective 2.3: Grassland Management**

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

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

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

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

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

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

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

*Strategies:*

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

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

**Objective 2.4: Invasive Plants and Animals**

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

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

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

*Strategies:*

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

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

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



*Sandhill Crane. USFWS*

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

*Strategies:*

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

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

**Objective 2.6: Threatened and Endangered Species Management**

Continue to monitor Bald Eagles.

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

*Strategies:*

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

**Objective 2.7: Deer Management**

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

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

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



White-tailed deer. Manley Dahler

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

*Strategies:*

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

**Objective 2.8: Furbearer Management**

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

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

*Strategies:*

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



*Wildlife photography. USFWS*

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

**Goal 3: Public Use**

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

**Objective 3.1: Wildlife Observation and Photography**

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

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

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

Strategies:

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

**Objective 3.2: Great River State Trail (Bicycling)**

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

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

Strategies:

1. Maintain existing gravel road surface.

**Objective 3.3: Interpretation**

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

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

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

Strategies:

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

**Objective 3.4: Environmental Education**

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

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

Strategies:

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

**Objective 3.5: Waterfowl Hunting**

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

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

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

Strategies:

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

**Objective 3.6: Fishing**

Continue current fishing program. Maintain existing facilities.

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

Strategies:

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

**Goal 4: Neighboring Landowners and Communities**

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

**Objective 4.1: Community Outreach**

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

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



Volunteers at Trempealeau NWR. USFWS

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

Strategies:

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

**Objective 4.2: Friends Group**

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

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

Strategies:

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

**Objective 4.3: Volunteers**

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

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

Strategies:

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



Culvert replacement at Trempealeau NWR. USFWS

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

**Objective 4.4: Partnerships**

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

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

Strategies:

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

**Goal 5: Administration and Operations**

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

**Objective 5.1: Entrance Road Flooding**

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

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

Strategies:

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

**Objective 5.2: Facilities**

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

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

Strategies:

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

**Objective 5.3: Staffing**

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

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

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

Strategies:

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

**Objective 5.4: Operations and Maintenance Needs**

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

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

Strategies:

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

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

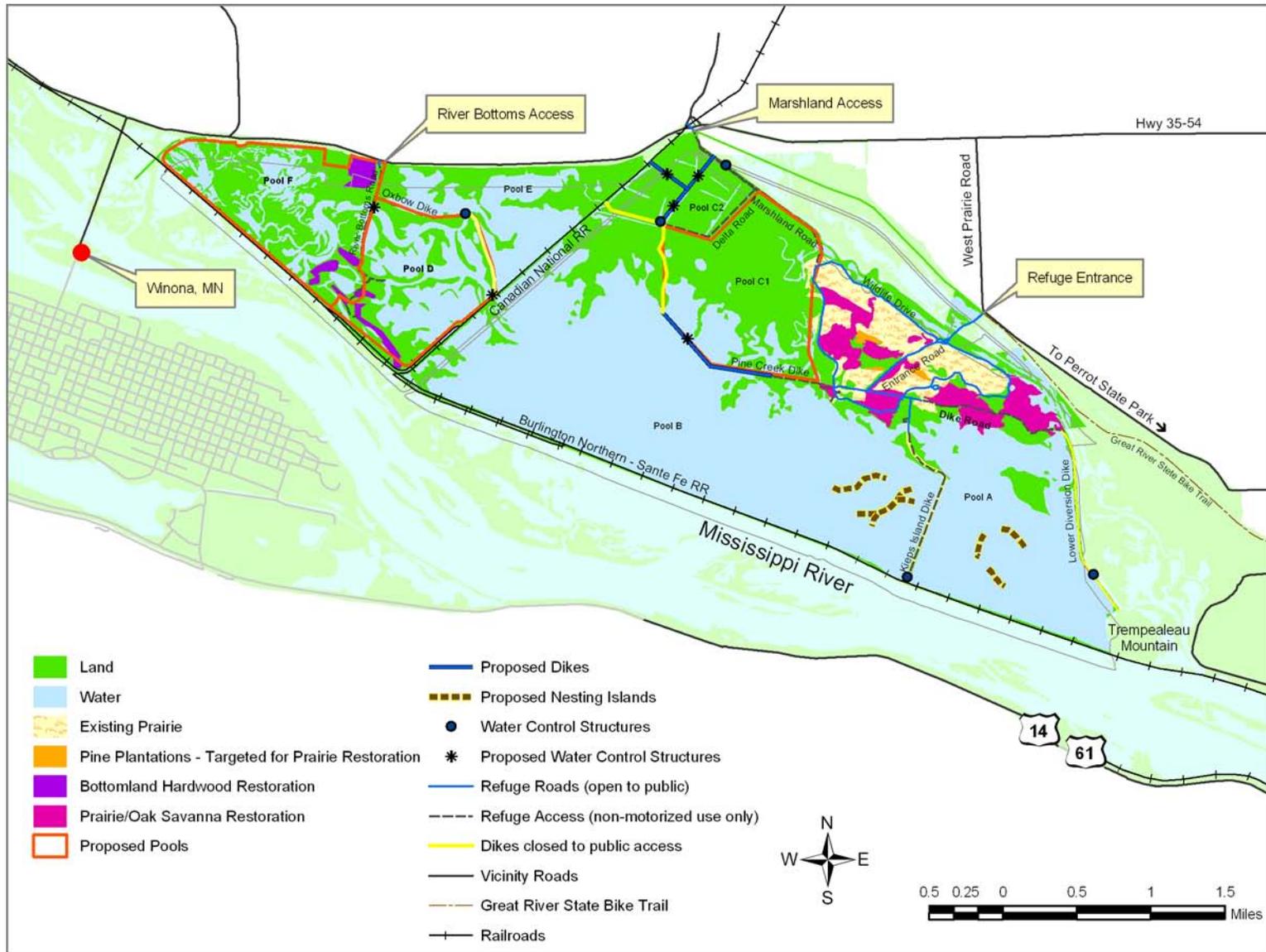
We will strive to maintain and improve the scenic and wild character, and environmental health of the Refuge.

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

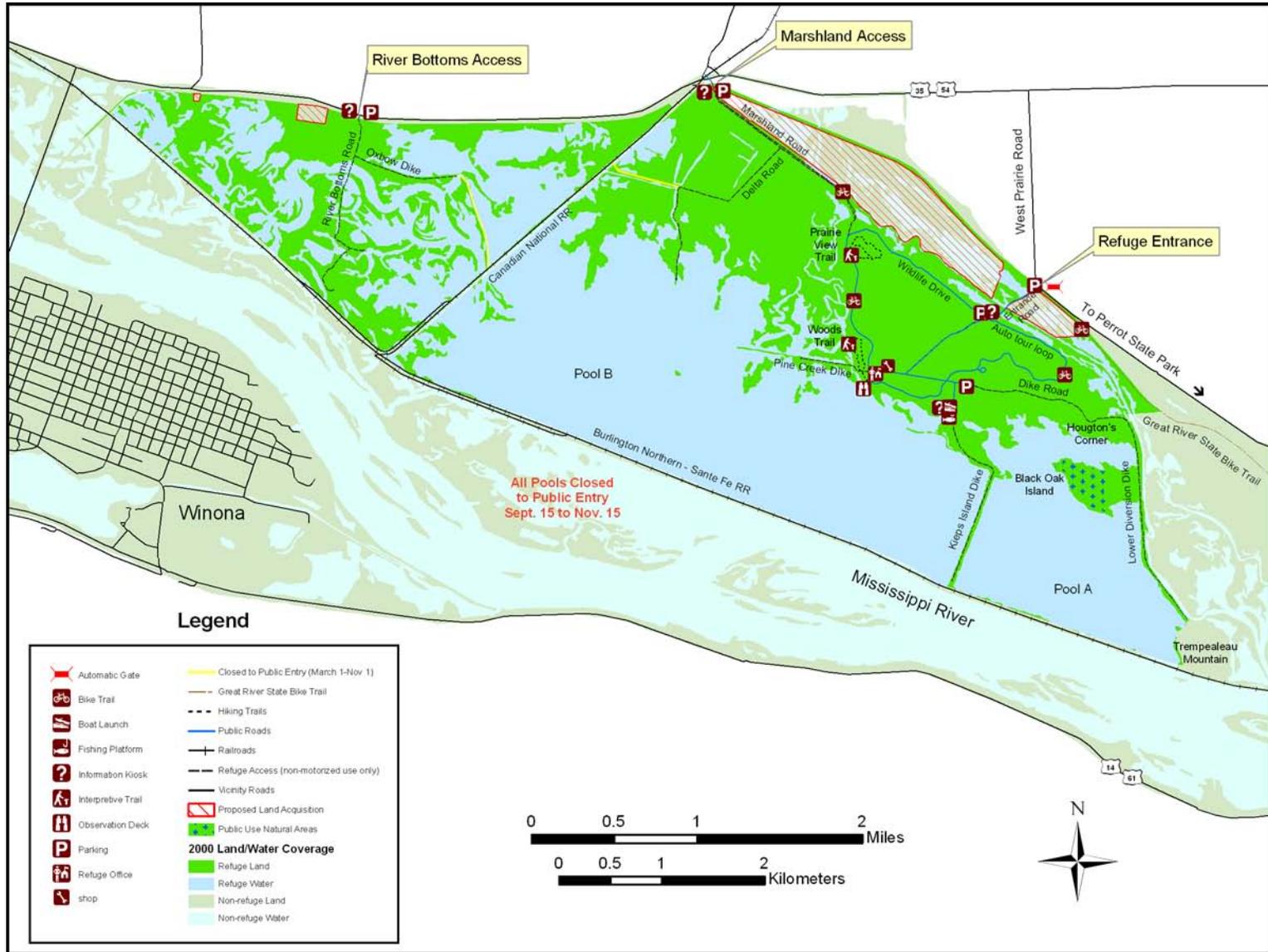
**Objective 1.1: Land Acquisition**

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

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



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



**Alternative B: Wildlife and Habitat Focus**

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

*Strategies:*

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

**Objective 1.2: Refuge Boundary**

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

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

*Strategies:*

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



*Prairie cone flower. USFWS*

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

**Objective 1.3: Flood Protection**

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

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

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

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

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

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

Strategies:

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

**Objective 1.4: Natural Area Management**

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

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

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

Strategies:

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

**Objective 1.5: Archeological Resources**

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

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

Strategies:

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

**Goal 2: Wildlife and Habitat**

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

**Objective 2.1: Forest Management**

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

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

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

*Strategies:*

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

## Objective 2.2: Wetland Management

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

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

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

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

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



Wetland habitat at Trempealeau NWR. USFWS

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

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

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

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

Strategies:

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



*Lead plant. USFWS*

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

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

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

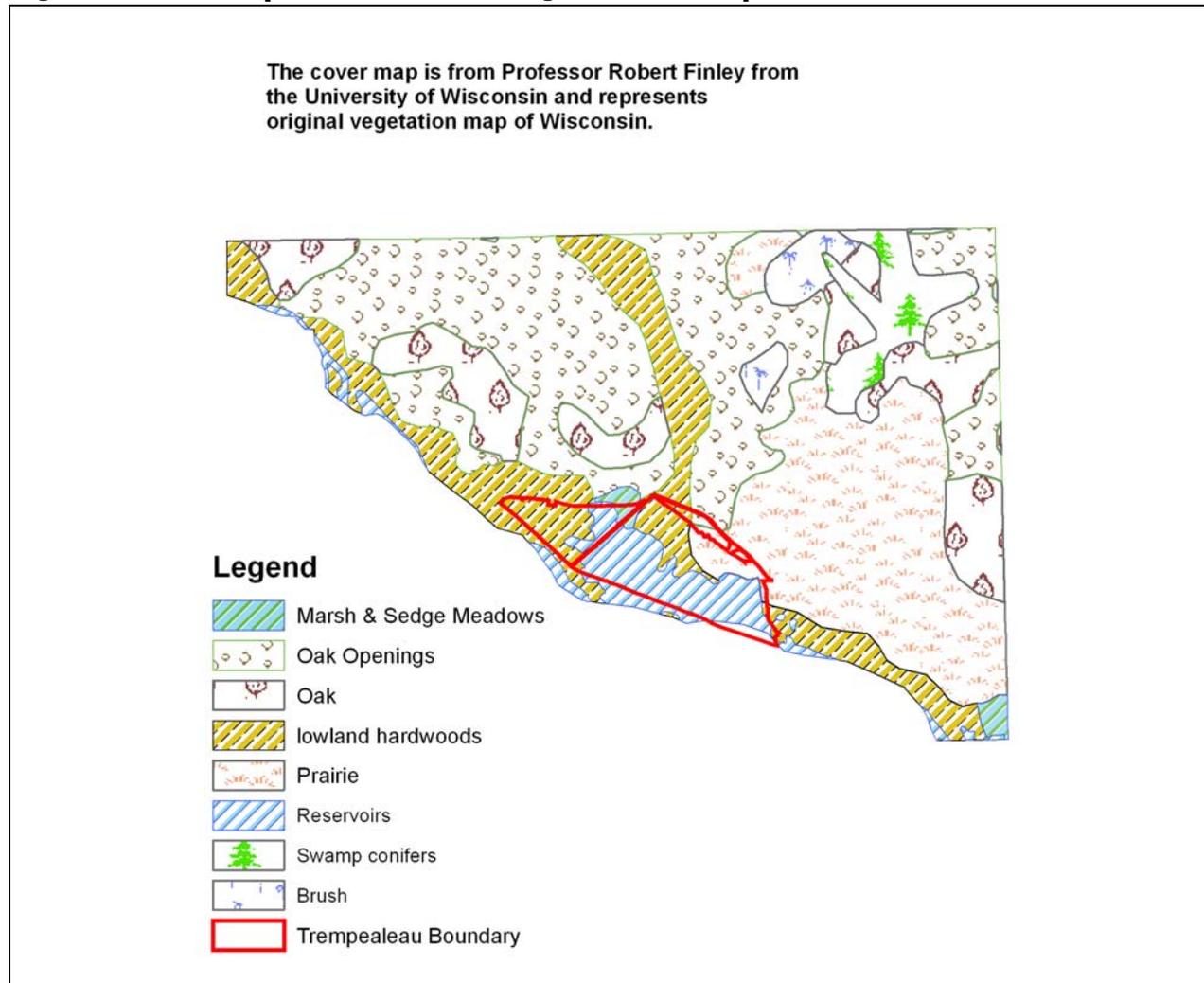
### Objective 2.3: Grassland Management

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

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

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

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

**Figure 9: Pre-European Settlement Vegetation, Trempealeau NWR**Strategies:

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

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

#### Objective 2.4: Invasive Plants and Animals

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

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

##### Strategies:

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

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

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

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

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

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

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

Strategies:

1. Engage other experts and partners to develop and implement a Wildlife Inventory Plan that includes all federal and state listed species, regional conservation species, furbearers, and deer.
2. Hire a permanent, full-time biologist to conduct surveys and process data.

3. Work with partners, volunteers, students and staff to store, summarize and, as appropriate, analyze survey data annually.
4. Continue to work with universities, states, USGS, and the COE to share data on species and habitats.
5. Participate in formal coordination meetings with USGS to share biological data, monitoring and monitoring expertise.
6. Work with the Upper Mississippi NWFR GIS biologist and the Winona District biologist to coordinate equipment, staff, survey schedules, and data analysis.

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

**Objective 2.6: Threatened and Endangered Species Management**

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

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

Strategies:

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

**Objective 2.7:Deer Management**

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

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

Strategies:

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



Observation deck at sunset, Trempealeau NWR. USFWS

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

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

#### Objective 2.8: Furbearer Management

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

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

#### Strategies:

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

### Goal 3: Public Use

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

#### Objective 3.1: Wildlife Observation and Photography

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

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

Strategies:

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

#### Objective 3.2: Great River State Trail (Bicycling)

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

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

Strategies:

1. Maintain existing gravel road surface.

#### Objective 3.3: Interpretation

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

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

Strategies:

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



Cyclists using the Great River State Trail. USFWS



*Environmental Education Days presented on the observation deck. USFWS*

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

#### **Objective 3.4: Environmental Education**

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

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

##### Strategies:

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

#### **Objective 3.5: Waterfowl Hunting**

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

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

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

##### Strategies:

1. Clearly sign boundaries of areas closed to hunting.

#### **Objective 3.6: Fishing**

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

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

##### Strategies:

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

## Goal 4: Neighboring Landowners and Communities

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

### Objective 4.1: Community Outreach

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

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

#### Strategies:

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

### Objective 4.2: Friends Group

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

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

#### Strategies:

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

### Objective 4.3: Volunteers

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

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

#### Strategies:

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



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

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

#### **Objective 4.4: Partnerships**

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

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

#### Strategies:

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

#### **Goal 5: Administration and Operations**

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

#### **Objective 5.1: Entrance Road Flooding**

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

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

#### Strategies:

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

**Objective 5.2: Facilities**

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

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

Strategies:

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

**Objective 5.3: Staffing**

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

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

Strategies:

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

**Objective 5.4: Operations and Maintenance Needs**

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

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

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

Strategies:

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

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

**Goal 1 Landscape**

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

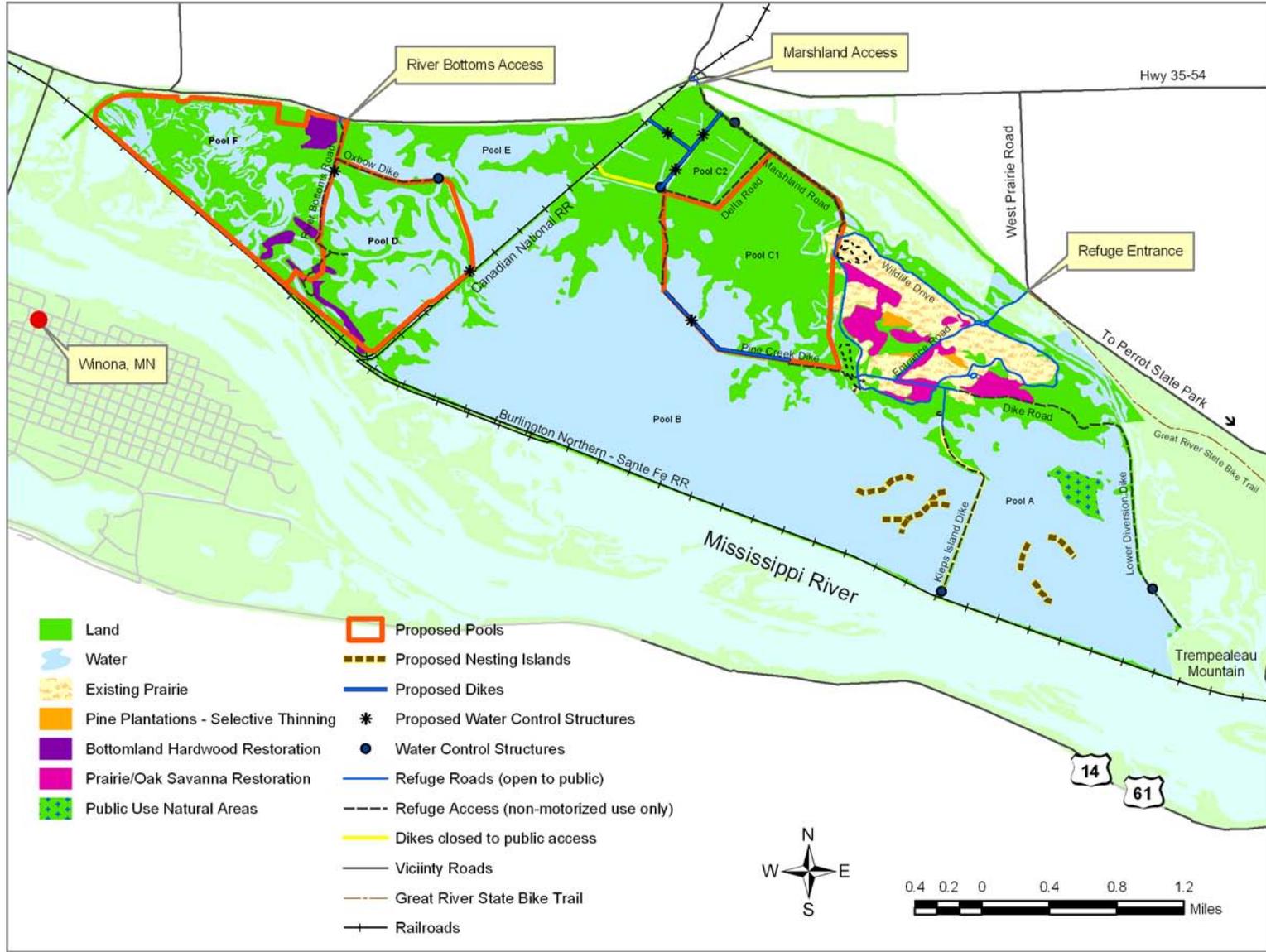
Figure 10 represents habitat under Alternative C and Figure 11 on page 64 represents visitor services. Figure 12 on page 65 represents a closer view of visitor services under Alternative C.

**Objective 1.1: Land Acquisition**

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

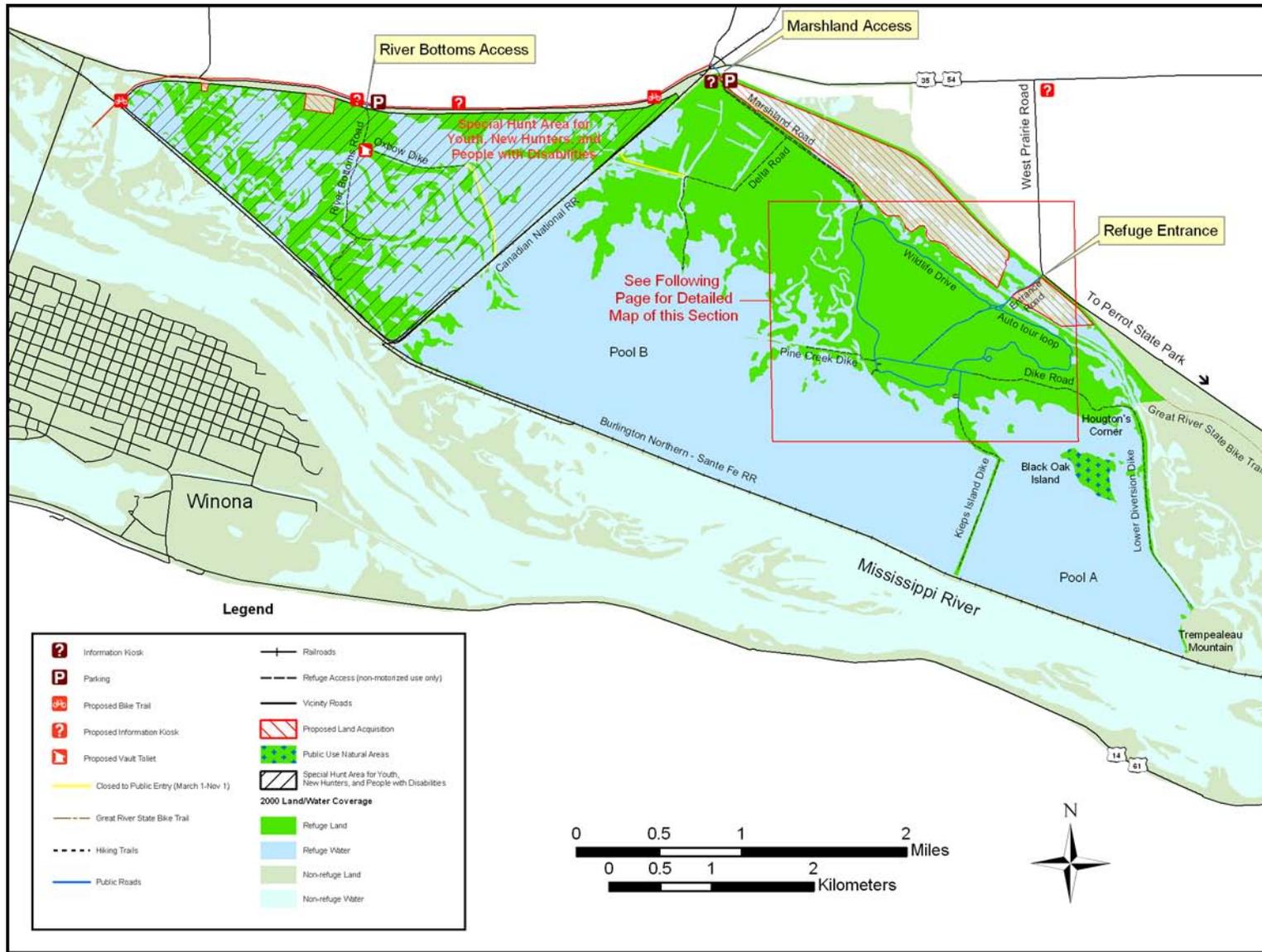
*Rationale:* Land acquisition can be a cost effective tool to ensure protection of important fish and wildlife habitat and to close gaps in the existing boundary. All of the properties in question are in the floodplain and subject to sporadic flooding. The system of dikes, constructed in the early 1900s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

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



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

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



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



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



Blazing star. USFWS

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

Strategies:

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

**Objective 1.2: Refuge Boundary**

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

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

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

Strategies:

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

**Objective 1.3: Flood Protection**

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

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

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

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

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

Strategies:

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

**Objective 1.4: Natural Area Management**

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

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

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

Strategies:

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

**Objective 1.5: Archeological Resources**

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

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

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

Strategies:

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

**Goal 2: Wildlife and Habitat**

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

**Objective 2.1: Forest Management**

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

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

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

Strategies:

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



*European buckthorn in understory, Trempealeau NWR. USFWS*

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

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

### Objective 2.2: Wetland Management

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

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

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

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

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

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

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

#### Strategies:

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



Swamp white oak tree planting area, Trempealeau NWR. USFWS

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

**Objective 2.3: Grassland Management**

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

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

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

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

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

Strategies:

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



*Invasive black locust taking over prairie, Trempealeau NWR. USFWS*

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

**Objective 2.4: Invasive Plants and Animals**

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

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

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

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

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

Strategies:

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

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

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

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

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

*Strategies:*

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

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

**Objective 2.6: Threatened and Endangered Species Management**

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

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

Strategies:

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

**Objective 2.7: Deer Management**

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

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

Strategies:

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



White-tailed deer. Copyright Sandra Lines

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

14. Improve signage and develop a Refuge-specific hunting safety brochure.
15. Continue issuing over-the-counter permits for late season archery.
16. Continue to operate a check station on opening weekend.
17. Require mandatory reporting of hunter success or loss of 1 year hunting privileges.
18. Continue to follow Wisconsin guidelines for season dates and times.

#### Objective 2.8: Furbearer Management

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

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

#### Strategies:

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

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

### Goal 3: Public Use

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

#### Objective 3.1: Wildlife Observation and Photography

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

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

#### Strategies:

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



*Bird banding, Trempealeau NWR. USFWS*

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

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

### Objective 3.3: Interpretation

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

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

### Objective 3.2: Great River State Trail (Bicycling)

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

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

#### Strategies:

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



Interpretation book reading at a local library. USFWS

Strategies:

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

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

### Objective 3.4: Environmental Education

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

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

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

### Strategies:

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

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

### Objective 3.5: Waterfowl Hunting

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

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

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

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

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

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

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

#### Strategies:

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



Waterfowl hunt for people with disabilities at Trempealeau NWR. USFWS

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

#### Objective 3.6: Fishing

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

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

#### Strategies:

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

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

#### Goal 4: Neighboring Landowners and Communities

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

#### Objective 4.1: Community Outreach

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

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

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

Strategies:

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

**Objective 4.2: Friends Group**

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

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

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

Strategies:

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

**Objective 4.3: Volunteers**

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

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

Strategies:

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

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

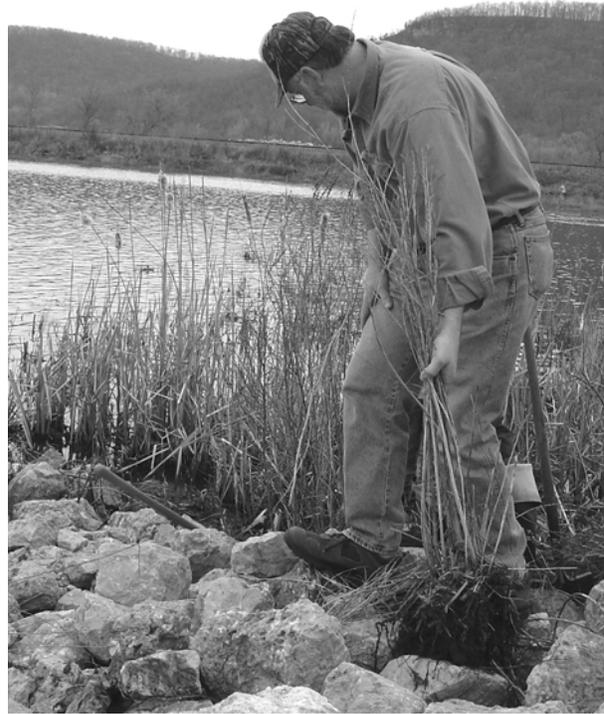
#### Objective 4.4: Partnerships

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

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

#### Strategies:

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



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

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

#### Goal 5: Administration and Operations

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

#### Objective 5.1: Entrance Road Flooding

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

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

Strategies:

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

**Objective 5.2: Facilities**

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

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

Strategies:

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

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

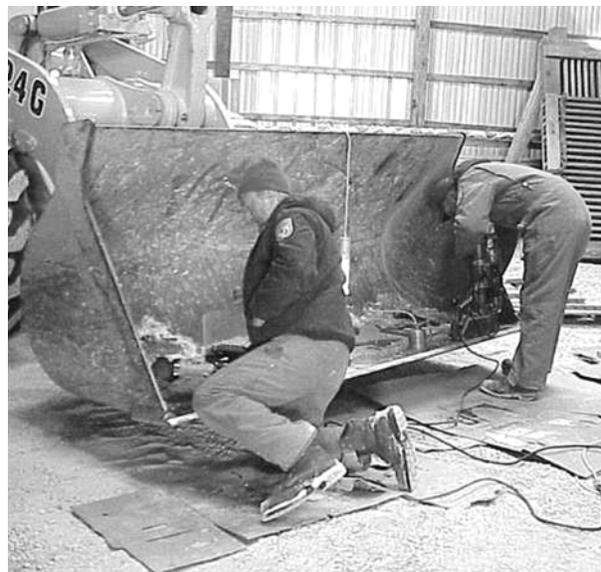
**Objective 5.3: Staffing**

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

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

Strategies:

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



*Equipment and facilities maintenance, Trempealeau NWR. USFWS*



*Aquatic vegetation sampling at Trempealeau NWR. USFWS*

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

**Objective 5.4: Operations and Maintenance Needs**

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

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

Strategies:

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

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

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

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

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

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

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

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

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

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

| Objectives                                     | Alternative   |  |   |
|--|---|--|---|
|  | A: No Action (Current Direction)  | B: Wildlife and Habitat Focus  | C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)   |
| <i>3.2 Great River State Trail (Bicycling)</i> | Maintain the existing portion of the Great River State Trail that traverses the Refuge.   | Same as Alt. A   | By 2010 improve the Great River State Trail by adding a variety of visitor services including, bike racks, potable water source, restrooms, and interpretive signs and brochures. By 2008, work with the WDNR and partners to facilitate extension of bike trail to Winona.   |
| <i>3.3 Interpretation</i>                      | Maintain existing interpretive signs, brochures and other materials for the public. Annually, provide two events for the public. Provide minimal staff led interpretive programming on an as requested basis. | Maintain existing interpretive signs, brochures and other materials for the public. Provide minimal staff-led interpretive programming on an as-requested basis. Emphasize invasive plant and habitat management in all interpretive materials and programs. | At 3-year intervals, random surveys indicate at least 90 percent of visitors report they felt welcome and enjoyed their visit, that they have an understanding of the Refuge as a place where wildlife comes first; and appreciate the role of the Refuge System in preserving our Nation's wildlife heritage.  |
| <i>3.4 Environmental Education</i>             | Annually host one environmental education event and conduct minimal education programs as requested.  | Conduct minimal environmental education programs, focusing staff and resources on wildlife and habitat management.   | Improve delivery of environmental education programs, and by 2010 have in place a comprehensive environmental education program that includes the following elements: <ul style="list-style-type: none"> <li>■ A grade-specific curriculum that meets local, state and national guidelines.</li> <li>■ A Refuge Educator's Guide.</li> <li>■ A 900-square-foot outdoor learning shelter, with restrooms.</li> <li>■ Special annual programs, lending library, and educational partnerships as noted in the strategies.</li> </ul> |
| <i>3.5 Waterfowl Hunting</i>                   | Continue the managed hunt west of the Canadian Pacific Railroad dike for people with disabilities.  | Maximize resting habitat for migratory birds by closing the Refuge to all waterfowl hunting.   | By 2009, amend the Refuge Hunt Plan to include a managed waterfowl hunt west of the Canadian Pacific Railroad dike that assures high quality hunting and provides opportunities for people with disabilities, youth, and other hunters new to the sport.  |

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

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

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

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