

IV. Plan Implementation

The future of Union Slough, like most National Wildlife Refuges, is dependent upon a public constituency that is aware of Refuge and environmental issues and is willing to work towards resolving them. The expanded educational, recreational, and partnership opportunities proposed in this Plan will help build and maintain this needed constituency. Promoting the Refuge as a natural and recreational asset of Kossuth County will enhance the Refuge's image and help expand local support.

1. Partnerships

A key component to implementing this Plan will be the formation of private and public partnerships.

2. Watershed Steering Committee

Another key component to implementing this Plan will be the formation of a Watershed Steering Committee made up of individuals representing a variety of organizations involved in the Refuge watershed. The Refuge Manager will promote the establishment of this committee and be responsible for building strong project awareness and support. This committee will be responsible for guiding conservation activities in the watershed.

3. The Partners For Wildlife Program

The Service's Partners for Wildlife program has funded several wetland restorations within the watershed over the past 10 years. With its increased authority to assist with upland restorations as well as wetlands, there is now considerable overlap with the goals of this Plan. Over the next 15 years, Partners for Wildlife biologists will actively seek and develop ways to work with landowners in the Refuge watershed. They will develop voluntary wildlife habitat projects as they have traditionally done, but they will also assume a more active role in water quality projects such as sediment basins, treatment wetlands, filter strips, grassed waterways, and critical area plantings. Upland and wetland easements within the watershed will also be handled by the Partners for Wildlife biologists.

4. Annual Work Plans

Future annual work plans will be written to reflect the priorities and intent of the Plan. When discretionary funding and staff time is available, it will be used to implement components of the Plan.

5. Step-Down Plans

The Plan provides conceptual guidance for potential future expansion, management, and development of the Refuge. Before implementing the strategies and projects, additional plans (step-down plans) will need to be prepared. These range from site development plans to updating the grassland and water management plans. In the past, the Regional Office has provided limited assistance in preparing brochures, signs, and engineering. The trend is to downsize the staff in the Regional Office making the availability of these services more difficult in the future. Refuge staff will need to look for innovative partnerships with local professionals and businesses to help with preparing detailed plans.

6. Funding

Funding will come through a variety of internal and external sources. Refuge Maintenance funds will be used to renovate some of the facilities identified in the plan. However, these funds are in short supply. The Refuge staff will look for ways of leveraging and matching dollars through new and innovative public and private sources. The full implementation of this Plan will be dependent on new sources of funding as a result of partnerships and grants.

7. Refuge Friends Group

A Refuge friends group will be pursued as a means of connecting the Refuge with interested local citizens.

8. Volunteers

Volunteers will play a critical role in assisting staff with fulfilling the future vision of Union Slough Refuge.

9. Two Additional Staff

Two additional staff are proposed for the Union Slough Refuge to work specifically on implementing the Plan. This will bring the total Refuge staff to eight including one refuge manager, two assistant refuge managers, one administrative technician, two Partner's for Wildlife Program biologists, one refuge biologist, and one maintenance person.

10. Monitoring And Evaluation

Every two years the Plan will be revisited to document progress and reassess direction. Public involvement in evaluating progress and Plan implementation will be encouraged. Increased public visitation and new facilities will be evaluated for compatibility with wildlife resources of the Refuge.



1. Development Projects Map

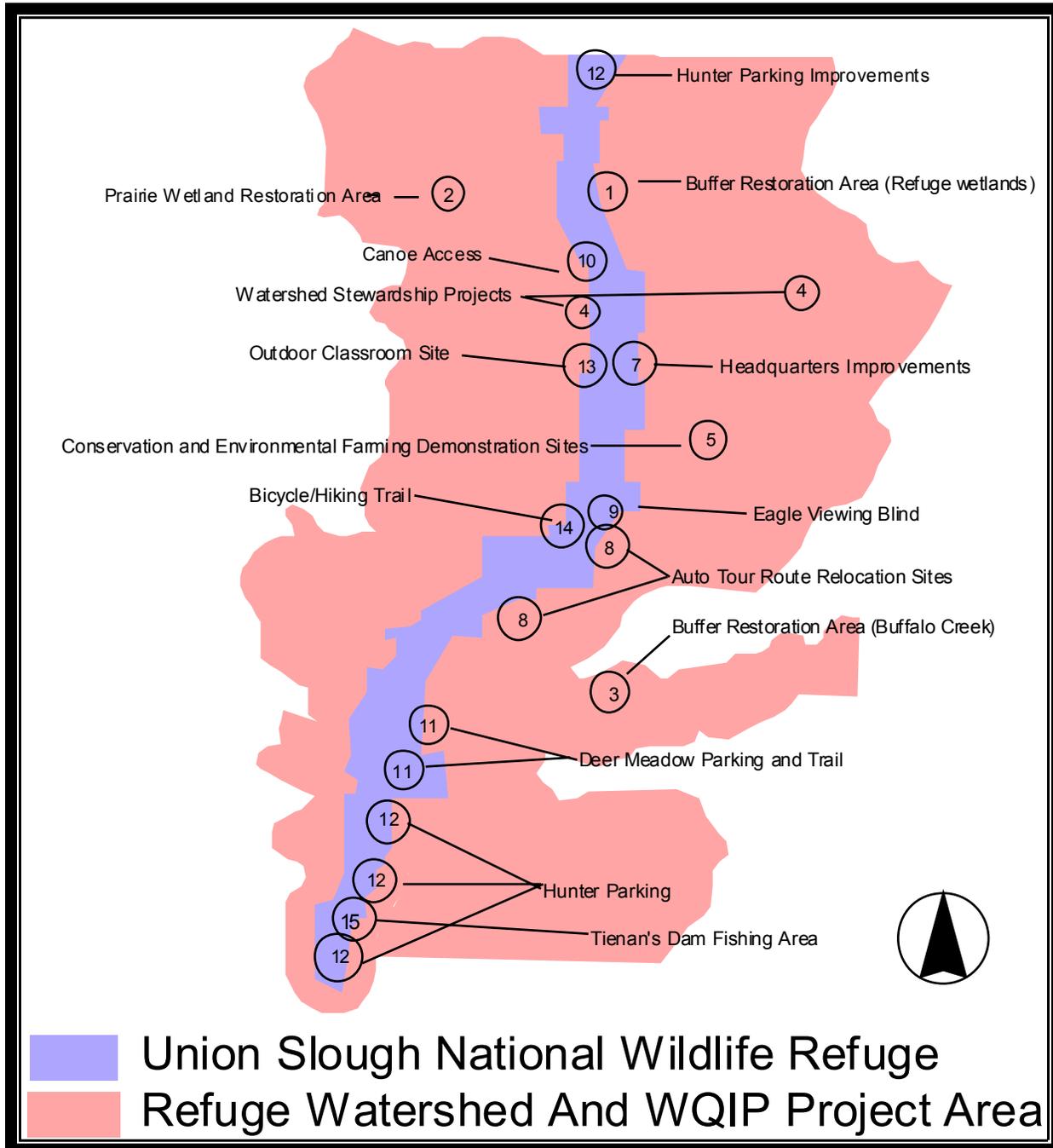


Figure 5 - Map of development projects proposed for the Refuge as a result of the Comprehensive Management Plan.

2. Development Projects Summaries

Project #1 Refuge Wetlands Buffer

Through a combination of voluntary partnerships, easements, and land acquisition, restore and preserve a 1/4 mile buffer between Refuge wetlands and adjacent farmlands (approximately 2,500 acres)(Figure 6). The proposed buffer will substantially reduce erosion and sedimentation, increase the amount (and quality of) nesting habitat for Refuge waterfowl and other migratory birds, and provide the public with additional opportunities for outdoor recreation. Seasonal wetlands would be restored by removing drain tiles or installing ditch plugs. Grasslands would be restored by planting the appropriate mix of native warm season grasses and forbs and controlling woody vegetation and weeds by prescribed burns and other techniques. This project will not adversely affect farm drainage on adjacent private land. Land acquisition by the Service could include 2,000 acres (easements and fee-title) and would be from willing sellers only. Estimated cost to the Service - \$5,600,000 (land acquisition and habitat restorations).

Project #2 Restoration of a Prairie Wetland Complex

Through a combination of voluntary partnerships, easements, and land acquisition, restore and preserve a 4,300 acre complex of wetlands and associated prairie habitats (Figure 6). Located within the Refuge watershed, the restored complex of wetlands and grasslands will reduce runoff and sedimentation into Refuge wetlands and provide important resting, nesting, and feeding habitat for migratory waterfowl, shorebirds, and songbirds. The Service intent is to intensify and concentrate Federal, State, local, and private resources within the Refuge watershed. This will be accomplished through existing incentive programs, easements, and land acquisition. Land acquisition by the Service (easements and fee-title) could include 1,250 acres and would be from willing sellers only. Estimated cost to the Service - \$3,500,000 (land acquisition and habitat restorations).

Project #3 Buffalo Creek Buffer

Through a combination of voluntary partnerships, easements, and land acquisition restore and preserve a 1/4 mile buffer around the lower reaches of Buffalo Creek (approximately 1,500 acres)(Figure 6). The proposed buffer would reduce sedimentation and increase the amount (and quality of) nesting habitat for Refuge waterfowl and other migratory birds. Projects through the Service's Partners for Wildlife Program, such as stream bank stabilizations, cooperative management agreements, and native grass plantings would be emphasized. Land acquisition by the Service (easements preferred) could include 500 acres and would be from willing sellers only. (Estimated cost to the Service - \$1,150,000).

Project #4 Watershed Stewardship Projects

To meet the broad water quality goal and specific objectives for nutrient and sediment control within Refuge wetlands, a long term watershed stewardship initiative will be implemented by the Service and interested partners. Headed by the Refuge Manager and a Watershed Advisory Committee, this initiative will seek to promote widespread use of Best Management Practices, Integrated Crop Management, and other environmentally friendly farming practices within the Refuge watershed. Outreach to farmers in the watershed will be a primary component of this initiative. More specific on-the-ground actions will include stabilizing erosive soils and constructing treatment wetlands to reduce nitrates in tile/ditch water before it enters Refuge wetlands. Treatment wetlands require site conditions with adequate slope to ensure no disruption of farm drainage. Two to three treatment wetlands will be constructed on Refuge property or on private lands with cooperating landowners. (Estimated cost to the Service - \$35,000)

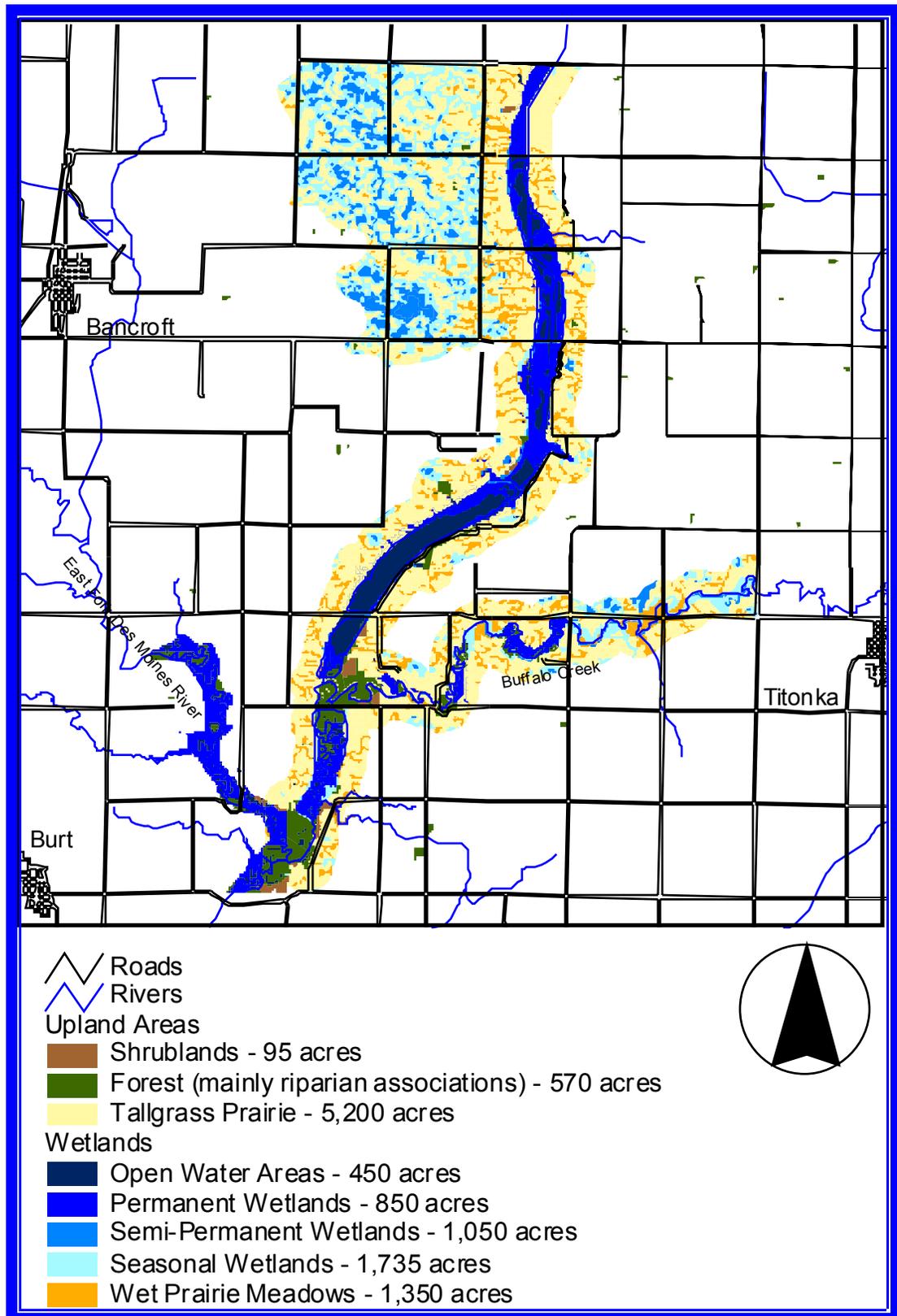


Figure 6 - The Service's desired future habitat condition (conceptual) for the Refuge and surrounding area once the habitat objectives have been met.

Project #5 Conservation and Environmental Farming Demonstration Sites

Selected projects will demonstrate conservation and environmental farming practices along the Refuge auto tour route. Through the use of existing incentive programs, a Service easement, or a private lands extension agreement, the Service will facilitate creation of applicable demonstration sites on lands visible from the Refuge auto tour route (Estimated cost to the Service - \$2,640).

Project #6 Waterfowl Nesting Structures And Predator Exclusion Areas

The Service and interested partners will fabricate and install 200 additional waterfowl nesting structures within a one mile radius of Refuge wetlands, develop two 40 acre predator exclusion areas for nesting waterfowl (electric fence areas), and create two nesting islands within Refuge wetlands to enhance waterfowl production. Actual size and location of fenced areas and nesting islands will be determined through additional studies (Estimated cost to the Service - \$30,000).

Project #7 Refuge Headquarters Improvements

Improvements to the Refuge headquarters will greatly enhance staff and visitor functions at the Refuge. Information will be provided during evening hours and weekends, office space will be more efficient, and an indoor orientation space will be gained for school groups. Improvements include an office addition (624 sf), an observation deck and information kiosk, paving the entrance drive and parking area, installing a gate, and native plant landscaping. (Estimated cost to the Service: \$100,320)

Project #8 Auto Tour Route Relocation

Reduce disturbance to Refuge wildlife by relocating approximately 2 miles of the Refuge auto tour route. Public will benefit by the auto tour route being open for a much longer period. Roadway improvements would accommodate cars and buses and use by bicycles. Old roadway located along Refuge pools will be restored to natural habitat. (Estimated Cost to the Service: \$269,500)

Project #9 Eagle Viewing Blind

In conjunction with the relocation of the auto tour route, construct an eagle viewing blind to allow the public to observe concentrations of Bald eagles at Union Slough. Develop gravel pull-off site to accommodate 5 cars, a trail, and an observation blind at a distance that allows viewing without disturbance to roosting eagles. (Estimated Cost to the Service: \$8,360).

Project #10 Wetland Monitoring and Maintenance Access

A boat ramp will be developed primarily for maintenance and monitoring activities on Refuge wetlands. The area will be constructed one mile north of the Refuge headquarters along pool D near an existing maintenance road. (Estimated Cost to the Service: \$500)

Project #11 Deer Meadow Access and Trail

Renovation of this existing facility will provide handicap accessibility and new opportunities to observe wildlife from an added observation deck. Interpretive information would be provided on the trail as it meanders through a floodplain forest, a hillside prairie, and overlooks the Refuge wetlands. Existing parking areas at Deer Meadow and Deer Watch sites will be renovated with new gravel and post and rail barriers. Trail surface will be constructed of accessible 3/8 minus crushed limestone. The 6 foot wide trail will be approximately 1 ½ mile in length with a loop design. The bridge crossing Buffalo Creek will be replaced to provide linkage to the deer watch site on the north. (Estimated Cost to the Service \$51,700)

Project #12 Hunter Parking Improvements

Upgrade location, capacity and image of seasonal parking areas. New signs will provide the public with information on Refuge opportunities and limitations. Upgrade parking to FWS standards. Add one 10 car and one 5 car parking site at the north end of Buffalo Creek. Upgrade boat launching site at Buffalo Creek by adding signs and gravel. (Estimated Cost to the Service: \$25,300)

Project #13 Outdoor Classroom Development

This project will provide educational benefits to local and regional schools and government agencies by providing an outdoor laboratory to study such things as water quality, wetlands, watersheds, and conservation and environmental farming. Construct a 22' x 32' shelter for gathering, orientation, and group study. Construct a network of trails and floating boardwalk to provide access to wetlands. All facilities will be fully accessible and built to Service standards. (Estimated Cost to the Service: \$128,700)

Project #14 Bicycle and Hiking Trail Addition

Providing bicycle and hiking activities on the Refuge will attract new visitors to the Refuge. Visitors will have an alternative to using a motorized vehicle. Construct a 5-mile bike/hike loop trail that originates and ends at the Refuge headquarters. Trail will utilize the shoulder of auto tour route and county road. New trail on the cross dike and on the west side of Pool C will be made of 6 foot wide 3/8 minus compacted crushed stone. Final alignment will be determined based on ownership patterns, land suitability, aesthetics, and potential for wildlife disturbance. (Estimated Cost to the Service: \$121,000)

Project #15 Tienan's Dam Fishing Access

Because of the problems associated with sedimentation and the need to control exotic fish (namely carp), only one fishing area on the Refuge was selected for improvement. Proposed improvements to this site will increase safety, enhance physical access, and resolve current trespass problems on private land. Conduct fishery evaluation and site investigation. Construct basic visitor access facilities including parking for 5 cars, trail, rip rap, and safety rails at dam and toilet. Access across private land will need to be resolved prior to proceeding with development plans. (Estimated Cost to the Service: \$79,200)

Project #16 Refuge Signs Upgrade

The Refuge's public image, public awareness, and identity will be enhanced through installing new signs and upgrading others. Work with local governments and the Service's Sign Shop to develop a sign plan for Refuge lands and adjacent county roads (Estimated Cost to the Service: \$33,000)

Project #17 Printed Brochures

Public information is extremely important at Union Slough. Printed materials for distribution are needed including a general refuge brochure, handouts for teachers on their use of the Refuge for environmental education, and printed materials promoting conservation and environmental farming practices in the Refuge watershed (Estimated Cost to the Service: \$27,500).

Project #18 Sediment Monitoring System

Construct and install monitoring stations throughout Refuge wetlands to measure current and future rates of sedimentation and to provide a means to measure the success of the watershed stewardship initiative. (Estimated Cost to the Service: \$1,320)

Project #19 Geographic Information System (GIS) Development

The Refuge watershed must be mapped using GIS technology. A GIS will help monitor and evaluate land use/cover trends and will assist landowners in applying conservation and environmental farming practices. With other agency partners, collect, digitize, and analyze data and print and distribute maps which inform and educate people living and working within the Refuge watershed (Estimated Cost to the Service: \$37,500).