

Appendix B: Land Protection Plan

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B.1 Introduction

Project Description

Neal Smith National Wildlife Refuge (NWR, Refuge) was established in 1991 to reconstruct about 8,600 acres of the tallgrass prairie ecosystem “from scratch” on former farmland in central Iowa. Although tallgrass prairie once covered much of the central United States and Canada, the ecosystem is now globally endangered. Less than one percent of this historic mosaic of prairie, savanna, and wetland remains today, and many prairie-dependent wildlife species are declining range-wide.

Priorities for the Refuge include restoration and reconstruction of native plant and wildlife diversity and the ecological functions and processes that sustain them. About 5,500 acres within the approved boundary have been acquired from willing sellers. Several thousand acres of farmland have been seeded with tallgrass prairie plants, resulting in a 100 percent conversion to wildlife habitat. The few remaining remnants of native prairie and savanna, degraded by fire suppression, are under restoration.

This portion of Iowa is characterized by heavily dissected drainage systems such as the Walnut Creek basin. The current Refuge boundary includes about 6.5 miles of 10-mile-long Walnut Creek and 45 percent of its watershed. The headwaters of Walnut Creek and its tributaries lie mainly outside the Refuge boundary to the north, east, and west. Walnut Creek empties into the Des Moines River at Lake Red Rock about three miles south of the Refuge. Although farm fields dominate the landscape surrounding the Refuge, Chichaqua Bottoms Greenbelt to the north (8,600 acres) and Lake Red Rock to the south (52,800 acres) provide additional protected wildlife habitat.

Study Area

During the process of developing the Comprehensive Conservation Plan (CCP) for Neal Smith NWR, the U.S. Fish and Wildlife Service (FWS, Service) evaluated land protection and restoration options for a 20,550-acre study area outside the existing approved Refuge boundary. The study area encompasses lands that connect the Refuge to Chichaqua Bottoms Greenbelt and Lake Red Rock and includes the entire Walnut Creek watershed. The evaluation also considered options for conserving remnant prairies in surrounding counties that might provide seed sources for Refuge restoration.

B.2 Threats to Resources

Grassland bird population declines

More than 97 percent of the native grasslands of the United States have been lost, mostly because of conversion to agriculture. As a result, grassland bird populations nationwide have declined from historic

levels far more than any other group of birds. However, many species that had been largely extirpated from central Iowa, such as Henslow's Sparrow, Dickcissel, and Upland Sandpiper, are beginning to return to the Refuge as the integrity of its ecosystem improves and as additional habitat is created. More than 200 bird species now use the Refuge, including more than 80 species during breeding season. Avian diversity is complemented by more than 40 mammal species including the endangered Indiana bat, 28 species of reptiles and amphibians, and nearly 60 butterfly species including the rare regal fritillary.

Watershed alteration

Hydrologic changes in the Walnut Creek watershed affect the Service's ability to restore Refuge lands. In the uplands, subsurface drainage tiles on and near the Refuge cause drier soils, making sustainable reconstruction of prairie, savanna, and upland sedge meadow habitat more difficult. In the floodplain, straightening and down-cutting of the creek bed has increased erosion and water flow through the Refuge and degraded floodplain habitat; invasive reed canarygrass has overtaken many locations. Sediment and contaminants end up in Lake Red Rock.

However, the creek is slowly moving toward a new state of equilibrium. This is a natural process, probably aided by conversion of agricultural fields to prairie on the Refuge and widespread use of conservation tillage on farmland upstream. The creek bed down-cutting has largely stabilized, and the channel is gradually widening again as the stream banks collapse (Schilling et al., 2011). Given current trends, the creek will eventually restore many of its natural functions. Slope of banks will decrease, terraces and channel meanders will begin to emerge, and floodplain vegetation communities will become established. The time needed for these changes to occur naturally is on the order of decades to centuries.

Habitat loss and urban development

Neal Smith NWR, Chichaqua Bottoms, and Lake Red Rock each provide diverse habitat for wildlife but are separated by large expanses of farmland. Some prairie wildlife such as reptiles, amphibians, small mammals, and butterflies have difficulty crossing agricultural areas so may be unable to move between the Refuge and other protected areas. State highway 163 and Interstate 80 provide additional barriers to terrestrial wildlife movement within the study area.

The Refuge is located in Jasper County, a primarily rural area just 20 miles east of Des Moines. Development pressure is increasing around the Refuge as the city and suburbs expand. The metropolitan area has a population of more than 500,000 people and recent highway improvements have made commuting from Jasper County to Des Moines much easier. If land surrounding the Refuge is subdivided and houses built, the possibility of restoring it to tallgrass prairie sometime in the future would be lost.

B.3 Proposed Action

The Environmental Assessment (Appendix A) includes evaluation of four options for future management direction on Neal Smith NWR. Table B-1 below summarizes Refuge boundary expansion recommendations under each of the four alternatives.

Table B-1: Summary of land protection by environmental assessment alternative on Neal Smith NWR

Alternative A Current Direction (No Action)	Alternative B Refuge Grassland Bird Focus (Preferred Alternative)	Alternative C Watershed Focus	Alternative D Corridor Focus
Acquire and manage lands only within existing Refuge boundary (8,600 acres total).	Acquire and/or protect an additional 3,210 acres to include tributaries of Walnut Creek that flow through the Refuge.	Acquire and/or protect an additional 14,600 acres to include the entire Walnut Creek watershed.	Acquire and/or protect an additional 20,550 acres that connect the Refuge to Chichaqua Bottoms Greenbelt and Lake Red Rock.

Alternative B (Refuge Grassland Bird Focus) has been selected as the preferred alternative and is the basis for the CCP. The preferred alternative includes expansion of the Refuge boundary by 3,210 acres to the east and west of the current boundary to encompass the headwaters of all Walnut Creek tributaries that flow through the Refuge. The expansion area lies south of Highway 163 and north of County Road 70. Fee title acquisition from willing sellers within the Refuge boundary is likely to be the most viable option for meeting objectives, although easements or cooperative agreements also may be feasible in some locations.

Objectives of the proposed action are to:

- Increase populations of grassland bird species of concern on the Refuge.
- Improve the quality and sustainability of habitat for tallgrass prairie wildlife on the Refuge by reestablishing more natural soil moisture and water flow patterns.
- Work with partners to increase the conservation value of lands that connect the Refuge to Chichaqua Bottoms Greenbelt and Lake Red Rock.

This Land Protection Plan proposes acquiring only those lands of highest conservation value to Neal Smith NWR and to the National Wildlife Refuge System (NWRS, Refuge System) and is the most cost-effective means of achieving Refuge objectives. The proposed action would ensure a net increase in the biological integrity and diversity of the Refuge. Declining populations of grassland birds and other native wildlife will benefit from increased habitat acreage and improved quality of habitat on the Refuge. An intact, resilient ecosystem will be better able to withstand outside pressures including urban development and climate change.

Service lands will be managed to reconstruct and restore the tallgrass prairie ecosystem. Agricultural fields will be planted to native vegetation and managed to increase wildlife and plant diversity and to improve habitat for declining populations of grassland birds and other wildlife. As far as possible, ecosystem processes that historically sustained the system (such as hydrology, fire, and grazing), will be restored.

The boundary expansion will permit restoration of more natural hydrology on Refuge prairies, savannas, and upland sedge meadows by reducing or eliminating the subsurface drainage system. More natural water flow will help native vegetation outcompete invasive plant species while reducing the threat of erosion and headcutting. Walnut Creek will be allowed to reach a new equilibrium on its own over time.

Service acquisition priorities within the proposed Refuge boundary are:

- Lands facing imminent threat of development that would irreparably destroy wildlife values.

- Lands important for reduction of subsurface drainage and restoration of more natural soil moisture regimes on the Refuge.
- Lands that will reduce habitat fragmentation and help consolidate the Refuge into manageable units.

Refuge staff will assist agency partners, landowners, and other stakeholders in their efforts to restore and protect habitat and wildlife outside the expanded Refuge boundary. Priority areas for such assistance include the Walnut Creek watershed north and south of the Refuge, connections with Chichaqua Bottoms Greenbelt, and prairie remnants of high conservation value. Refuge staff may provide technical assistance and other support as requested, but any fee-title acquisition, easements, and on-going management responsibility in these areas would be provided by others.

Ultimately, restoring ecological functions and values in the tallgrass prairie ecosystem in central Iowa will require conservation and restoration of both public and private lands. Neal Smith, Chichaqua Bottoms Greenbelt, and Lake Red Rock could serve as core areas of permanently protected and restored habitat connected by a matrix of public and private conservation lands.

Estimated Initial Costs:

Purchase 3,210 acres of agricultural land @ \$6,000/acre = \$19.3 million

Prepare sites and plant native prairie species @ \$1,000/acre = \$3.2 million

B.4 Other Land Protection Alternatives Considered

Current Direction (Alternative A)

Land acquisition would continue within the current approved Refuge boundary, but the boundary would not be expanded to include any additional lands. Reliance would be on existing federal, state, and local programs and authorities to address threats to Refuge resources.

Watershed Focus (Alternative C)

Under Alternative C, the Refuge boundary would expand by 14,600 acres to include the entire Walnut Creek watershed. Service land ownership would facilitate major efforts to restore the hydrology of Walnut Creek. Small-scale measures (such as grade control structures and silt fences) might help somewhat but are expensive and unlikely to be successful in the long term. Any serious attempt to engineer the restoration of Walnut Creek would require moving massive amounts of dirt, require fee title acquisition by the Service or buy-in from private landowners upstream, and take many years with a low likelihood of success at a very high monetary cost.

However, given current trends, the creek and its floodplain will return to a more natural equilibrium and water quality will continue to improve, although it will be a very long-term process. If this long-term approach is acceptable, then Service investment in the restoration of Walnut Creek would not be needed to meet Refuge objectives.

Increased acreage of restored tallgrass prairie within the watershed would provide additional habitat for migratory grassland birds and other native wildlife. Restoration of the southern reaches of the watershed would create a three-mile-wide habitat corridor linking the Refuge and Lake Red Rock. Most bird species, of course, can fly between nearby protected areas without the need for connecting corridors, but this connection could benefit reptiles, amphibians, small mammals, and invertebrates that

have trouble crossing agricultural areas. In the northern reaches, however, Highway 163 would continue to be a hazard to wildlife trying to cross it.

Alternative C would provide increased ecosystem resilience in the face of stressors such as urbanization and climate change and Service-owned lands would be permanently protected from development.

Estimated Initial Costs

Purchase 14,600 acres of agricultural land @ \$6,000/acre = \$87.6 million

Prepare sites and plant native prairie species @ \$1,000/acre = \$14.6 million

The cost of attempting an engineered restoration of Walnut Creek hydrology is unknown, but would be many millions of dollars.

Corridor Focus (Alternative D)

Under Alternative D, Refuge land acquisition would expand by 20,550 acres to allow establishment of a permanent wildlife habitat corridor connecting the Refuge with Chichaqua Bottoms Greenbelt to the north and Lake Red Rock to the south. These connections could benefit reptiles, amphibians, small mammals, and invertebrates that have trouble crossing agricultural areas. Highway 163 and Interstate 80, however, would pass through the Neal Smith – Chichaqua portion of the habitat corridor and would continue to be hazardous to wildlife trying to cross.

Increased acreage of restored tallgrass prairie within the watershed would provide additional habitat for declining populations of migratory grassland birds. The Greater Prairie-Chicken has been proposed for reintroduction but currently would be difficult to manage successfully on the Refuge due to the limited land base. This species has a large home range and requires a variety of grassland habitat conditions to meet its life cycle needs. Establishment of a habitat connection between the Refuge and Chichaqua would increase the probability of developing a self-sustaining Greater Prairie-Chicken population in central Iowa.

Some habitat improvement could continue to be accomplished without Service land acquisition through existing programs and the committed efforts of the many conservation partners working in the Chichaqua – Neal Smith – Red Rock corridor. Pooling of resources by federal, state, and local agencies; private landowners, and other conservation groups would facilitate accomplishment of mutual goals. Service land acquisition and restoration, however, would provide permanent protection from development and increased ecosystem resilience in the face of long-term stressors such as climate change.

Estimated Initial Costs

Purchase 20,550 acres of agricultural land @ \$6,000/acre = \$123.3 million.

Prepare sites and plant native prairie species @ \$1,000/acre = \$20.6 million

Prairie Remnants (Alternative E)

The Refuge only uses native prairie seed from sources originating within about 100 miles of the Refuge. These “local ecotype” seeds are adapted to local climate and soil conditions and have a better chance of survival than seeds grown farther away. In the early years of Refuge restoration, seed was primarily collected on small pieces of native prairie that had never been cleared for agriculture.

The need to include some or all of these prairie remnants as part of Neal Smith NWR was evaluated as part of this Land Protection Plan. The focus was on areas east, south, and west of the Refuge that are not included within the boundary of Northern Tallgrass Prairie NWR (where the Service already has acquisition authority). The Iowa Department of Natural Resources' 2003 Statewide Prairie Inventory identified more than 700 remnants within this zone, ranging in size from less than 0.1 acre to more than 200 acres. The average (mean) size is 7.3 acres.

Most of these remnants would benefit from restoration efforts to address problems such as non-native plant invasion and encroachment of trees. Many have not been inventoried so their species composition and conservation value are poorly known. Most are on private land, although some are owned and managed by state or local agencies.

Service acquisition of remnants would protect them in perpetuity and facilitate their restoration and management. However, off-Refuge remnants, although worth protecting, are no longer essential to Refuge restoration, because local ecotype seed now can be purchased from local suppliers or collected from restored sites on-Refuge. Management of many small tracts of land scattered over a multiple county area would be logistically difficult.

Many private landowners recognize the value of their remnants and are working to protect and enhance them. If additional public ownership becomes desirable, acquisition by state or local agencies could be financially feasible due to the small size and proportionally lower cost of the remnants compared to larger tracts of high quality agricultural land. Refuge staff could provide technical assistance to state, local, and private efforts, if needed.

Alternative E was eliminated from further consideration in the Draft CCP.

B.5 Land Acquisition Funding

Funding to buy land for Neal Smith NWR comes primarily from the Land and Water Conservation Fund, which derives from certain user fees, proceeds from the disposal of surplus federal property, federal tax on motor boat fuels, and oil and gas lease revenues. About 90 percent of that fund now derives from Outer Continental Shelf oil and gas leases. The federal government receives about 40 percent of that fund to acquire and develop nationally significant conservations lands.

B.6 Sociocultural Impacts

Landowners

Expansion of the Refuge would affect to some degree the current lifestyles of individuals in and around the proposed boundary expansion. Landowners who choose to sell their land to the Service would be most affected. Landowners who choose not to sell their land would probably not be directly affected by purchases around them since they would retain all ownership rights such as hunting, control of trespass, farming, drainage, and pesticide use. If Service activity inadvertently created a water-related problem (flooding, soil saturation, deleterious increases in water table height, etc.) for any private landowner, the problem would be corrected at Service expense.

The Service's policy is to acquire land from willing sellers and only when other protective means, such as local zoning restrictions or regulations, are not appropriate, available, or effective. When land is needed to achieve fish and wildlife conservation objectives, the Service seeks to acquire the minimum interest

necessary to reach those objectives. If fee title acquisition is required, the Service gives full consideration to extended use reservations, exchanges, or other alternatives that will lessen the impact on the owner and the community. Donations of desired lands or interests are encouraged.

Although the Service has a long-standing policy of willing-seller-only acquisitions, it also has the power of eminent domain as do other federal, state, and local government agencies. This federal power, however, requires congressional approval and is rarely used by the Service. When acquiring lands, the Service is required by law to offer 100 percent of the property's appraised market value as established by an approved appraisal that meets professional standards and federal requirements.

Local Community

When land is purchased, it becomes the property of the U. S. Government and is exempt from taxation. The Refuge Revenue Sharing Act authorizes annual in-lieu-of-taxes payments to counties based on $\frac{3}{4}$ of 1 percent of the appraised value of Refuge land acquired in fee. In recent years, however, Congressional appropriations have been insufficient to pay the full amount authorized.

Lands purchased would be removed from agricultural production but would be protected from many of the effects of urban development. Refuge expansion would likely open more lands to public hunting, wildlife observation, photography, environmental education, and other compatible Refuge uses thereby enhancing local and regional opportunities for wildlife-dependent recreational activities, increasing Refuge visitation, and having a positive effect on the local economy.

B.7 Map

(see figure B-1, next page)

Figure B-1: Map of Alternatives

