

Squaw Creek

National Wildlife Refuge

Summary

Draft Comprehensive Conservation Plan and Environmental Assessment



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Comprehensive Conservation Plans provide long-term guidance for management decisions; set forth goals, objectives and strategies needed to accomplish refuge purposes; and, identify the Fish and Wildlife Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget

allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.



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Introduction

Squaw Creek National Wildlife Refuge (Refuge), is located in Holt County in northwest Missouri, approximately midway between Kansas City, Missouri and Omaha, Nebraska, 2.5 miles off Interstate Highway 29 (Figure 1). This 7,415-acre refuge includes approximately 6,700 acres of floodplain that is managed as wetland, grassland and riparian habitats that attract up to 250 Bald Eagles, 300,000 Snow Geese, and 100,000 ducks during fall and winter seasons.

The area within the authorized boundary of Squaw Creek NWR includes 7,815 acres. The Refuge manages the Squaw Creek Wildlife Management Area, which consists of small parcels of land within a 15-county area. Agriculture is the predominant land use in the area immediately surrounding the Refuge. Within the Squaw Creek Wildlife Management Area, the Refuge manages 34 easements obtained from the Farm Service Agency (FSA), previously known as the Farmers Home Administration, or FmHA. These easements lie in 10 of the 15 counties that make up the Squaw Creek Wildlife Management District.

The nearest community is Mound City, which has a population of 1,273 and is located approximately 5 miles from Refuge headquarters. The community's population has remained relatively stable and at the time of this writing did not present urban development issues that seriously threatened Refuge resources. The

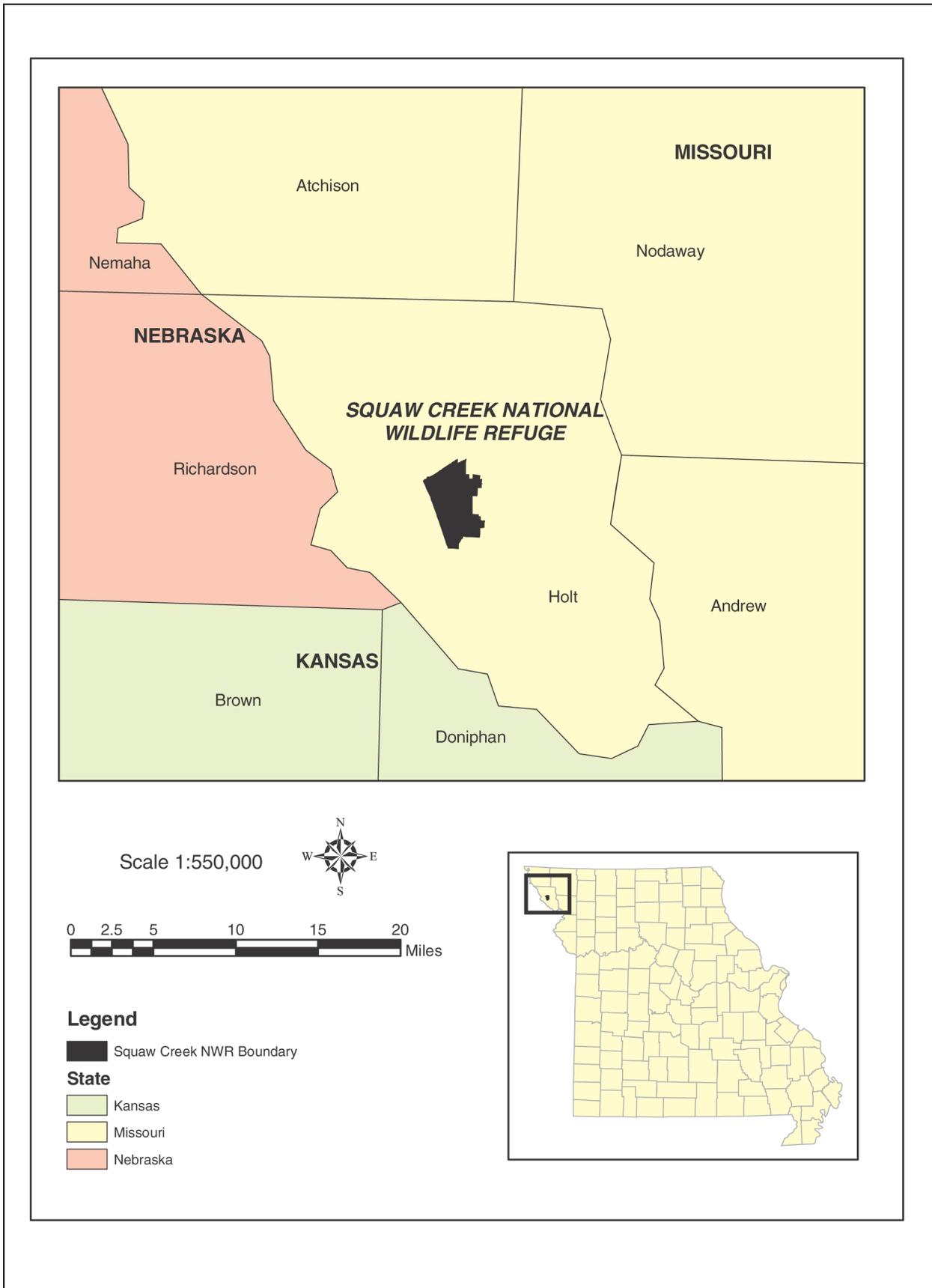
nearest big city is St. Joseph, Missouri, which has a population of 71,711 in 1995. Some development has occurred on the outskirts of the city, however St. Joseph is located approximately 30 miles from the Refuge and sprawl is not expected to affect Refuge resources.

The Refuge gets its name from Squaw Creek, a major stream that drains the Loess Hills on the east and flows through the Missouri River floodplain lands of the Refuge via a man-made ditch, and then empties into the Missouri River approximately 8 miles south of the Refuge. Davis Creek, which has also been ditched, flows along the eastern Refuge boundary and joins Squaw Creek just after leaving the Refuge. The Refuge's west boundary is about 5 miles from the closest bank of the Missouri River. The Santa Fe-Burlington Northern railroad embankment runs along the west Refuge boundary. Its embankment provides some protection from Missouri River overflows.

Refuge lowlands were once a part of a large natural marsh in the Missouri River floodplain. Historically, this area was heavily used by waterfowl and other migratory birds during their spring and fall migrations.

The almost 700 acres of Refuge upland include a segment of the 200-mile long band of hills known as the Loess Hills. The Loess Hills, formed by wind-deposited, silt-sized soil particles, are a geologic phenomenon unique to the

Figure 1: Location of Squaw Creek NWR



Missouri River Valley. While loess deposits do exist elsewhere in North America and the world, only in the Missouri River Valley are the deposits deep enough to create such an extensive land form. The Loess Hills support rare remnants of native prairie and prairie associated wildlife. The Refuge hosts 301 species of birds, 33 mammals, and 35 reptiles and amphibians. Missouri's largest wet

prairie remnant (983 acres) is on the Refuge and it is home to Missouri's largest meta-population of the Eastern Massasauga rattlesnake. The quality of Squaw Creek Refuge wetland habitat is constantly influenced by the heavy silt loads from the 60,000-acre Loess Hills watershed being carried into the Refuge by five creeks that converge to become Squaw Creek and Davis Creek.

Who We Are and What We Do



The Refuge is administered by the U.S. Fish and Wildlife Service, the primary federal agency responsible for conserving, protecting, and enhancing the nation's fish and wildlife populations and their habitats. The Service oversees the enforcement of federal wildlife laws, management and protection of migratory bird populations, restoration of nationally significant fisheries, administration of the Endangered Species Act, and the restoration of wildlife habitat such as wetlands. The Service also manages the National Wildlife Refuge System, which was founded in 1903 when President Theodore Roosevelt designated Pelican Island in Florida as a sanctuary for brown pelicans. Today, the System is a network of over 540 refuges covering more than 93 million acres of public lands and waters. Most of these lands (82 percent) are in Alaska, with

approximately 16 million acres located in the lower 48 states and several island territories.

The National Wildlife Refuge System is the world's largest collection of lands specifically managed for fish and wildlife. Overall, it provides habitat for more than 5,000 species of birds, mammals, fish, and insects. Refuges also provide unique opportunities for people. When it is compatible with wildlife and habitat conservation, they are places where people can enjoy wildlife-dependent recreation such as hunting, fishing, wildlife observation, photography, environmental education, and environmental interpretation. Many refuges have visitor centers, wildlife trails, automobile tours, and environmental education programs. Nationwide, approximately 30 million people visit national wildlife refuges each year.

Refuge Purpose

Signed into existence by President Franklin D. Roosevelt as the "Squaw Creek Migratory Waterfowl Refuge" on August 23, 1935, in Executive Order 7156, the Refuge's purpose was to "... effectuate further the purposes of the Migratory Bird Conservation Act." The Executive Order further stated that lands are to be used "as a refuge and breeding ground for migratory birds and other wildlife."

Throughout the 100-year existence of the National Wildlife Refuge System,

its functional direction and purpose have evolved to reflect its ever increasing value as a collection of irreplaceable habitats representing the diverse natural heritage of America. In so doing, the focus of individual refuges such as Squaw Creek have broadened from somewhat narrow definitions aimed at specific animal groups to include entire ecosystems and all of the wildlife and plants within them.



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Squaw Creek NWR is also managed to preserve, restore, and manage

wetland and upland habitats that represent the Lower Missouri River ecosystem for the benefit of a diverse complex of fauna and flora, with emphasis on threatened and endangered species; and, to provide opportunities for the public to enjoy wildlife-dependent recreation, including environmental education and public outreach.

Refuge Vision

The Refuge staff envision a future that includes:

- Restoration and preservation of the wetland ecosystems of the Missouri River floodplain continues to be the major management thrust of Squaw Creek National Wildlife Refuge.
- Refuge wetlands, which include the largest remnant wet prairie in Missouri, continue to provide safe habitat for concentrations of waterfowl and other birds during the migration and nesting seasons.
- The historic threat of wetland sedimentation has declined significantly as managers of the vast surrounding agriculture lands employ more conservative practices advocated by the Refuge staff and other agencies.
- The Refuge habitat diversity emphasizes both wetland and grassland, interspersed with stands of mixed shrubs and woodlands, managed on a scale to minimize habitat fragmentation and to be attractive to indigenous species as well as neo-tropical and passerine birds.
- Habitat diversity broadens each year as progress is made to convert former monotypic stands of reed canary grass, American lotus, and croplands to aquatic and upland species complexes that benefit both indigenous and migratory wildlife.
- Squaw Creek National Wildlife Refuge continues to be a destination for people to enjoy wildlife-dependent recreation. Dynamic environmental education and interpretive displays and programs, presented in well designed facilities, help the public to understand and become supportive of the Refuge staff's efforts to conserve, preserve and manage wildlife resources and their habitats.
- The Refuge serves as an outdoor laboratory for biological researchers whose study results aid in the management for species of special concern such as the Eastern Massasauga rattlesnake, Blandings turtle and the Least Bittern.
- The multi-disciplined staff of biologists, technicians, and support personnel are a well trained team proficient in their functions of serving Refuge visitors, cooperators, and the general public, in their stewardship of the resources put in their charge, and in their maintenance of Refuge facilities and equipment. This team places high value on its connections with the community and relies heavily on stakeholder input.
- The Refuge budget, staff, and administrative facilities are adequate to implement the strategies required to achieve the goals and objectives set forth in this plan.

Purpose and Need for a CCP

The Draft Comprehensive Conservation Plan (CCP) identifies the role Squaw Creek NWR will play in supporting the mission of the National Wildlife Refuge System and provides primary management guidance for the Refuge. The plan articulates management goals for the next 15 years and defines objectives and strategies that will achieve those goals. Several legislative mandates within the National Wildlife Refuge System Improvement Act of 1997 have guided the development of this plan. These mandates include:

- Wildlife has first priority in the management of refuges.
 - Wildlife-dependent recreation activities of hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation are the priority public uses of the Refuge System. These uses will be facilitated when they do not interfere with a refuge's purposes or the mission of the Refuge System.
 - Other uses of the Refuge will only be allowed when they are determined to be appropriate and compatible with the Refuge purposes and mission of the Refuge System.
- Providing a clear statement of direction for future management of the Refuge.
 - Giving Refuge neighbors, visitors, and the general public an understanding of the Service's management actions on and around the Refuge.
 - Ensuring that the Refuge's management actions and programs are consistent with the mandates of the National Wildlife Refuge System.
 - Ensuring that Refuge management is consistent with federal, state and county plans.
 - Establishing long-term Refuge management continuity.
 - Providing a basis for the development of budget requests for Refuge operations, maintenance, and capital improvement needs.



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Following the recommendations in the CCP will enhance management of Squaw Creek NWR by:

Refuge Issues

At the beginning of this planning project, people interested in the future of Squaw Creek NWR were invited to attend an open house at the Refuge and discuss their ideas on the Refuge's future with Refuge staff and Regional Office planners. Early in the planning process, we conducted focus group meetings to learn what management issues are important to the community. The Planning Team has also sought input into the planning process from the State of Missouri and

the Regional Office. The issues and concerns presented here evolved through these discussions.

As might be expected, public participants at the focus group meeting and the open house meetings offered both positive and negative views to the issues; i.e., some supported Refuge expansion or on-refuge hunting while others were opposed. The planning team considered all expressed views,

written and oral, in its development of alternative actions and the goals and objectives.

Issue 1. Wildlife Habitat and Resource Management

Extraordinary measures may be required to preserve the marsh environment that has historically attracted migratory waterfowl and other wildlife. Squaw Creek Refuge is a sump-like area that lies between the Missouri River on the west and the loess bluffs on the east. The steep slopes on the river side of the bluffs along with intensive agriculture result in heavy silt loads in Squaw Creek and Davis Creek that pass through the Refuge on their way to the Missouri River. While these creeks are the primary water source for the Refuge, they also dump considerable amounts of silt in the managed marsh units of the Refuge, making them steadily more shallow. These marsh areas could eventually fill completely and disappear. Deer numbers exceed the desired density of 20-25 deer per square mile, negatively impacting habitats such as understory vegetation in the bottomland forests. This negatively impacts other species of interest.

Issue 2. Land Management within the Watershed Impacts Refuge Water Quality and Quantity

While neither the Refuge nor the Fish and Wildlife Service has any interest or authority to interfere with private lands management, they do have the responsibility to conserve the public resources placed in their care. The Refuge is at the bottom of a 60,000-acre watershed. Land management practices within the watershed influence quality and quantity of water that flows into the Refuge. Unrestricted surface runoff in the watershed depletes top soil and soil moisture conditions. The deposition of top soil and agricultural chemicals in the Refuge marshes during flood stages has an adverse cumulative

effect. There are existing cost share programs available to landowners aimed at improved soil and moisture conservation.



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Issue 3. Snow Goose Management

The mid-continent population of Snow Geese and Ross' Geese are in trouble because there are too many – what some refer to as “a perilous abundance.” The peril is their numbers. The estimate of Snow and Ross' Geese in the central and eastern arctic increased from 1.1 million in 1973 to 5.8 million in 1998. These geese now exceed the carrying capacity of habitats on several breeding colony sites in northern Canada. Overgrazing and grubbing by geese causes a removal of the vegetative mat that insulates underlying sediments. Exposure of sediments causes an increase in the rate of evaporation and greater concentration of inorganic salts from marine clays. Increased soil salinity eventually eliminates growth of the salt-marsh community and desertification ensues. Bare mudflats may become colonized by salt-tolerant plants, which are utilized by few, if any, wildlife species.

Recovery of damaged Arctic tundra vegetation is extremely slow and tends to continue toward self destruction once the moisture and chemical balance is upset. High Snow Geese survival rates over the last 20 years and high quality wintering grounds has contributed to the over population. Action plans developed by

both the Canadian and U.S. Fish and Wildlife Service and State and Provincial agencies focus on reducing the Snow Goose population.

Concentrations of 300,000 to 400,000 Snow Geese at Squaw Creek NWR during the fall migration has become a sight-seeing tradition that attracts thousands of Refuge visitors. The Snow Geese are also welcomed by waterfowl hunters in an area from Sioux City, Iowa to Kansas City, Missouri. The large concentrations of geese on the Refuge provides significant hunting opportunity on adjacent public and private hunting areas. There is concern that opening the Refuge to more hunting would not only scare the geese out of the area, reducing overall hunting opportunity and the associated take of birds, but also restrict other public use such as the auto tour route and wildlife observation areas. Others felt some goose hunting on the Refuge would help address the mid-continent Snow Goose over-abundance.

Issue 4. Refuge Expansion

Floodplain wetlands similar to those within Squaw Creek NWR have been preserved and managed as private and commercial waterfowl hunting clubs. High operations costs have caused some owners to consider selling their property to the Refuge. Some of the Refuge marsh restoration and preservation problems associated with watershed management and runoff might be lessened if some of the adjacent agricultural land was added

Plant diversity on Squaw Creek NWR reflects the dominance of wetlands and prairie, including smooth sumac, coralberry, false indigo and swamp milkweed. There are also numerous grasses, including big and little bluestems and hairy grama.

The Refuge also features “Wildflower Gardens at Squaw Creek,” plantings

to the Refuge and converted to other uses. However, hydrological and biological data supporting this is incomplete or lacking.

Issue 5. Public Use

Public use at the Refuge has focused on nonconsumptive uses and wildlife dependent recreation, but some people have suggested that the Refuge's public use program should be changed to allow other compatible uses that might include hunting waterfowl and deer. Currently there is a special two-day muzzle loader deer hunt with a specific number of permits issued. Angling is allowed where the roads cross the creek ditches. Historically, environmental education has been emphasized at Squaw Creek NWR.

Issue 6. Public Service

The staff at Squaw Creek NWR want to be good neighbors and contributors to the welfare of the community. Public benefits now include environmental education programs for schools and special groups both on and off the Refuge, disaster assistance with staff and equipment, operations budgets that boost the local economy, annual payments to counties to offset losses of real property tax revenues, cost share programs for environmental improvements on private lands, and attraction of visitors who patronize local businesses. As the Refuge strives to be of service to the public and the community, are there new or better ways it can be successful in its efforts?

around the Visitor Center of native tallgrass-prairie and woodland wildflowers, grasses, and other plants.

The Refuge has 1,378 acres of forests. Common trees include Eastern red cedar, Eastern cottonwood, black willow, and silver maple.

The Refuge Environment

The principle Refuge habitats include agricultural fields, bottomland forest, bottomland mesic prairie, loess hill forest, loess hill prairie, managed wetlands, old fields, wet prairie, wetland and developed land. (Figure 2).

Waterfowl are a year-round presence on the Refuge, sometimes in awesome numbers. Squaw Creek NWR is a mecca for large concentrations of migratory birds during the spring and fall because of the diversity and interspersed habitats as well as the Refuge's location between two major migratory bird corridors, the Central Flyway and the Mississippi Flyway.

Shallow, backwater wetlands such as those provided by Squaw Creek NWR offer critical habitat for dabbling ducks, geese, herons, egrets, bitterns and rails. Mallard, Gadwall, American Widgeon, Green-winged Teal, Blue-winged Teal, Northern Pintail and American Coot are the dominant species seen on the Refuge during both spring and fall migration. In the spring, large numbers of Scaup and Ring-necked Ducks are common.

Average peak populations of Lesser Snow Geese are 300,000 to 350,000.

During the fall migration, the Pectoral Sandpiper, Killdeer, Stilt Sandpiper, Lesser Yellowlegs and Least Sandpiper are among the shorebird species using the Refuge. In the spring, Greater Yellowlegs, White-rumped Sandpiper and Semipalmated Sandpiper pass through.

Marsh birds and other water birds, including grebes, pelicans, cormorants, bitterns, herons, egrets, ibis, and rails, are typically counted during the shore bird surveys.

Raptors using the Refuge include the Bald Eagle (in the Draft CCP, see Section 3.2.3.7, Threatened and Endangered Species) and a variety of

hawks. In 2001, a local college professor counted 214 Broad-winged Hawks on a hawk count day.

Several bird species that are on the Missouri endangered species list are known to occur on the Refuge, including: Bald Eagle, American Bittern, Northern Harrier, Snowy Egret, Peregrine Falcon, Swainson's Warbler, Least Tern and Barn Owl.

Just a mile north of the Refuge, a Loess Hills bluff on the Missouri Department of Transportation right-of-way on Highway 159 provides outstanding Bank Swallow nesting habitat. The Missouri Department of Transportation (MoDOT) recently set aside the area for that purpose. The department built a pull-off parking area with barriers and installed a wood split rail fence. The Service prepared an information sign interpreting Bank Swallow history and habits. The Refuge installed "do not disturb" signs intended to prevent harassment of the swallows.

Other birds commonly found on the Refuge include the Red-winged Blackbird, Common Grackle, Tree Swallow, Barn Swallow, Great-blue Heron, Yellow-bellied Cuckoo, Red-headed Woodpecker, Red-bellied Woodpecker, Common Yellowthroat, Northern Cardinal, House Wren, Song Sparrow, European Starling, Yellow Warbler and Grey Catbird.

Mammals

Approximately 33 mammal species use the Refuge. Annual deer counts indicate that the Refuge has about three times as many deer as desired to maintain healthy browse and to avoid negative impacts to understory vegetation. Even though the Refuge has an annual muzzle loader antlerless deer hunt, which typically removes 100-140 deer from the area, the Refuge continues to harbor deer densities well above carrying capacity,



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suggesting that the Refuge is probably a concentration area for deer. Future efforts to expand the refuge hunting program are planned in an attempt to reduce the local deer population.

A number of carnivorous mammals are seen on the Refuge, including grey fox, red fox, coyote, mink, raccoons, striped skunk and spotted skunk, bobcat, longtail weasels, badgers and river otters. Other mammals on the Refuge include rabbits and several species of bats, rodents and shrews.

Amphibians and Reptiles

Two species of salamander, four toad species and five species of frogs are found on the Refuge. The Refuge has participated in deformed frog surveys and the number of deformed frogs found on Squaw Creek NWR is well within the bounds of what is considered to be normal deformity rates. The Refuge has also conducted annual frog and toad calling surveys.

Five species of turtles, including the state listed endangered Blandings turtle, are found on the Refuge. Reptiles include two lizard species and 15 snakes, including the Eastern Massassauga rattlesnake, a species that is a candidate for federal listing as threatened or endangered and is a state-listed endangered species.

Fish

Fish resources are limited. The lack of deep water and the fluctuation in water levels in the managed wetlands effectively limit the species found on the Refuge. Game species are not typically found on the Refuge. Fish such as carp, buffalo, gar, and a variety of others are present, and when water levels are sufficient and state law permits, snagging and fishing are permitted.

Invertebrates

Invertebrate diversity, while extensive, is little documented. The only insect on the Regional Conservation Priority list that falls within the Lower Missouri Ecosystem is the American burying beetle (*Nicrophorus americanus*). This species is not known to occur on the Refuge. It uses many types of habitat, with a slight preference for grasslands and open understory oak hickory forests. However, the beetles need carrion the size of a dove or a chipmunk to reproduce. Carrion availability may be the greatest factor determining where the species can survive. Its range includes Michigan and Ohio.

Plants

A full inventory and quantification of plant species has never been undertaken on the Refuge and presents opportunities for expanded work. The Refuge Biologist is currently inventorying plants and has created an herbarium for reference.

Threatened and Endangered Species

One federally-listed endangered bird and two threatened birds occur on the Refuge. Three state-listed threatened reptiles (Eastern massassauga rattlesnake, Western fox snake and Blandings turtle) are also found on the Refuge. The federally listed species include:

Figure 2: Current Landcover, Squaw Creek NWR

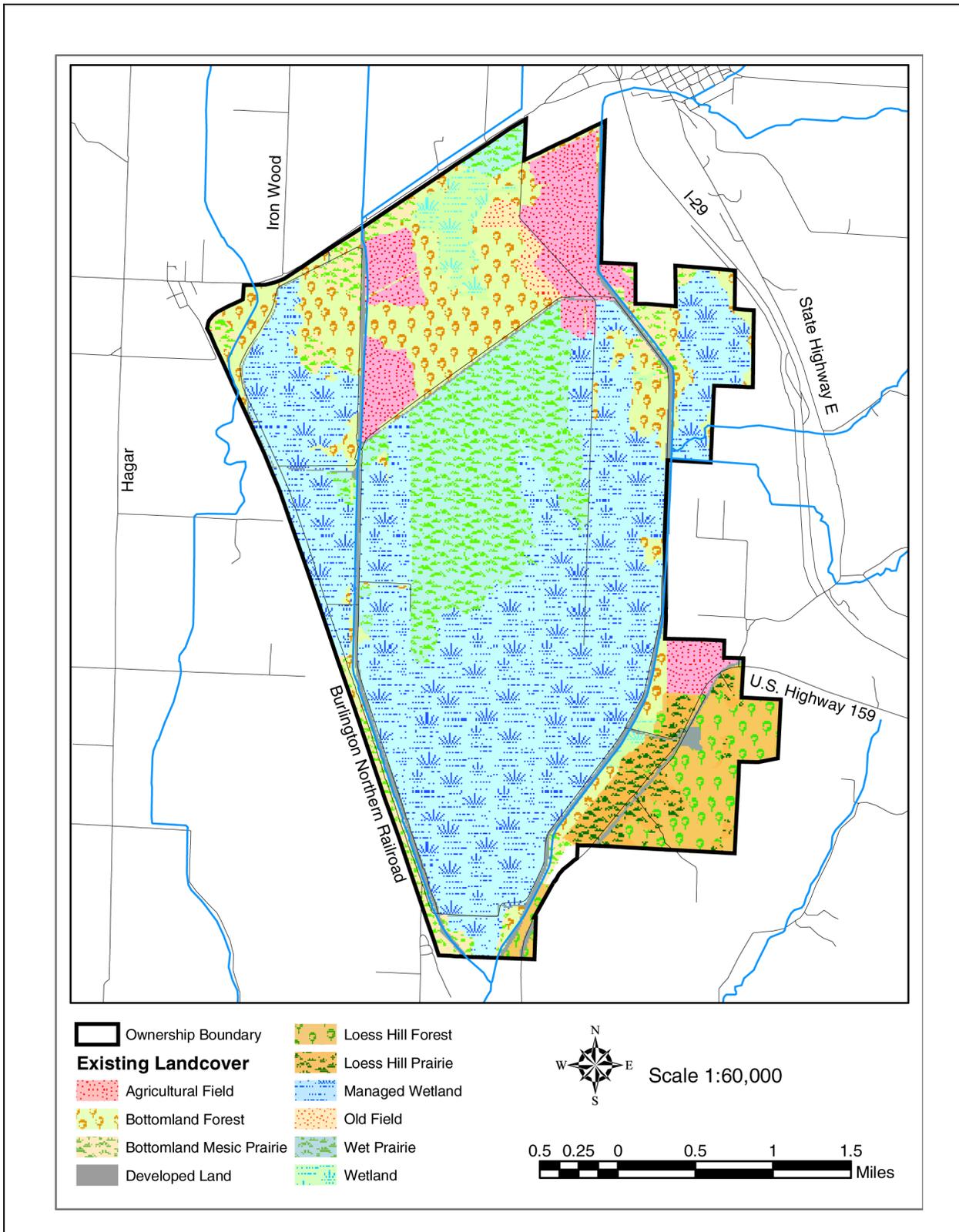
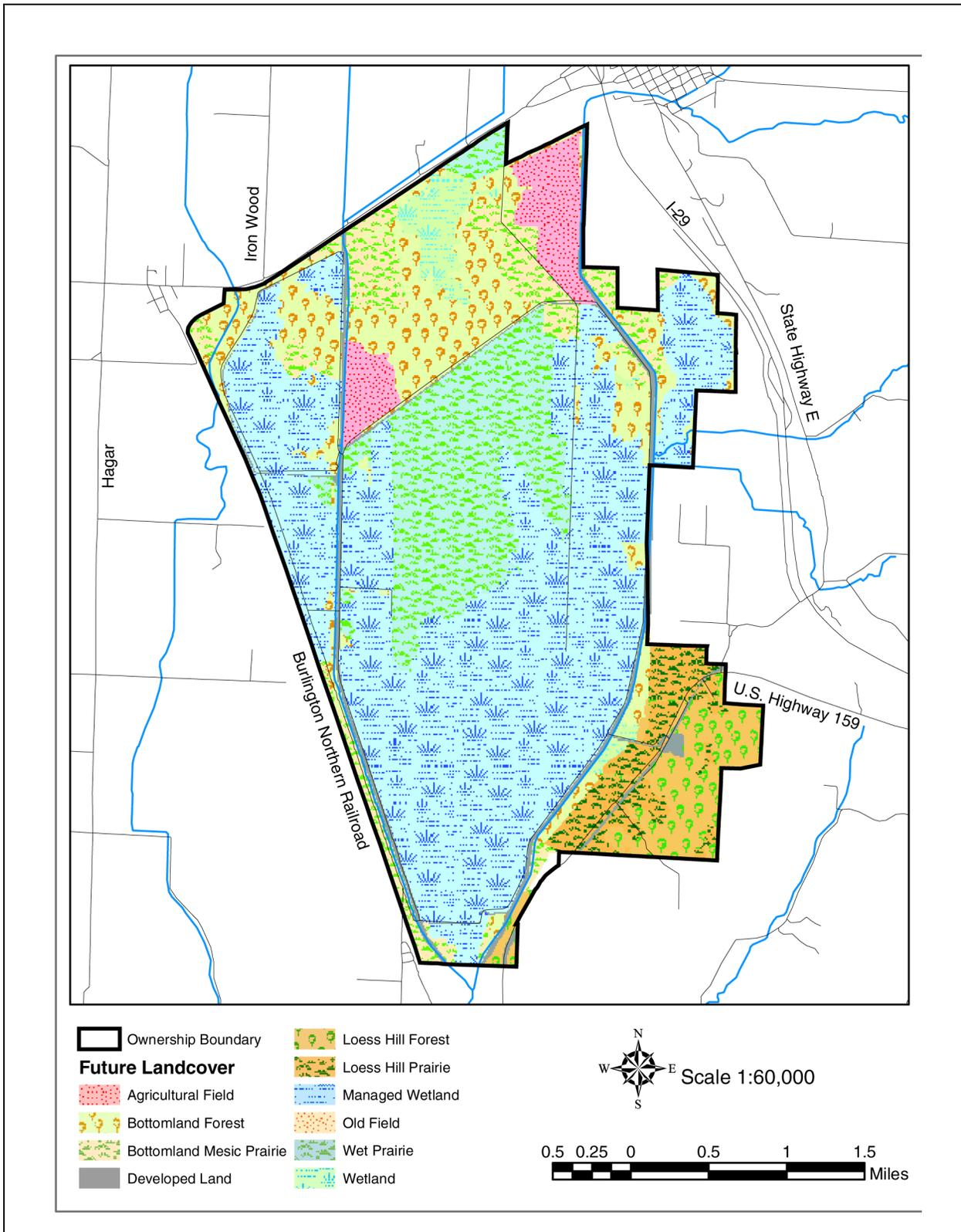


Figure 3: Desired Future Landcover, Squaw Creek NWR



Bald Eagle (*Haliaeetus leucocephalus*): Bald Eagles have increased in abundance and distribution across the United States, including Missouri, and have been reclassified from endangered to threatened. They are commonly seen on the Refuge; in fact, 476 Bald Eagles were counted on December 27, 2001. Bald Eagles became endangered because of habitat loss, but especially because of DDT use following World War II. Today, the DDT threat is largely gone. Now the challenge is to prevent contamination and loss of sites that eagles depend on for nesting, feeding, migration, and wintering.

Piping Plover (*Chadarius melodus*) (Great Plains Population): Piping Plovers are rarely seen on Squaw Creek NWR. Piping Plovers nest in coastal areas, but they are also prairie birds, nesting across the Great Plains of the United States and Canada, but in perilously low numbers. The Great Plains population is listed as threatened. The loss of prairie wetland areas contributes to their decline. Like many shorebirds, Piping Plovers feed on immature and adult insects and other invertebrates at the water's edge. They winter primarily along beaches, sandflats, and algal flats on the Gulf of Mexico.

Least Tern (*Sterna antillarum*) (Interior Population): Listed as endangered, the Least Tern nests along large rivers of the Colorado, Red, Mississippi, and Missouri River systems. Least Terns are considered a rare bird on Squaw Creek NWR, however the species is a potential nester in the Missouri River area. It nests on sand and gravel bars and protected beach areas of large rivers and winters in coastal Central and South America. The species is endangered because human disturbance and alteration of river systems has rendered much of its nesting habitat unusable. Pesticides



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may reduce food available to the tern by reducing the numbers of small fish in their feeding areas.

Visitor Services

The visitor center/headquarters at the Refuge has approximately 875 square feet of exhibit space. It is open to visitors Monday through Friday all year-round and every day from mid-March to early May, and again from mid-October to early December. Exhibits include dioramas and mounted wildlife specimens. An addition to the visitor center in 2003 includes an auditorium that seats 100 people. Outside the visitor center there is an overlook with interpretive signs and an information kiosk.

A major visitor attraction is the arrival of thousands of Snow Geese on their fall and spring migration routes. A 10-mile auto tour route, a hiking trail, interpretive panels, and two observation platforms facilitate the viewing of the flocks.

There are two hiking trails near the visitor center. The Mike Callow Memorial Trail (0.25 mile) is accessible to visitors with disabilities. The Loess Bluff Trail (0.25 mile) climbs from the visitor center to the top of the loess bluffs, providing a panoramic view of the Refuge.

In fiscal year 2001, Squaw Creek NWR's visitation totaled 134,245 visits with Visitor Contact Station

visits totaling 41,683. A significant number of groups visit from local area Missouri school districts representing Holt County, St. Joseph City Schools, and Kansas City Metropolitan Schools. Out-of-state school districts from Kansas and Nebraska and two local college departments have also utilized Refuge resources.

In fiscal year 2001, visitors participating in interpretation and

nature observation totaled 177,742 on-site visits. A total of 290 talks, tours, and demonstrations were conducted that year. Interpretive foot trail uses totaled 13,650 visits and the auto tour had 134,245 visits. The visitor trail uses of the observation platform, Eagle Pool tower, and Callow Memorial Trail totaled 32,512 visits in 2001.

Management Alternatives

As part of the planning process, we evaluated different management options for the Refuge. This section describes those options.

A more detailed comparison of alternatives by specific objectives and general strategies can be found in Appendix K of the Draft Comprehensive Conservation Plan. Archaeological and cultural values would be protected as mandated by law under all alternatives.



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Alternative A: Current Management Practices (No Action)

Under this alternative there would be no major change in Refuge goals, objectives, and strategies. Some strategies would be revised to incorporate improved techniques, which have been learned from current management practices. The current goals and objectives call for maintenance and modest

enhancement of wetland habitat, upland habitat, fish and wildlife populations, public use, resource conservation, facilities, work force and administration. This alternative does not fully address long-term needs and issues such as constant sedimentation in the wetland management units, the mid-continent Snow Goose population problem, and land acquisition that would allow increased preservation and restoration of the Missouri River floodplain habitat.

Alternative B: Restore Historic Wet and Mesic Prairie

Squaw Creek NWR presently contains the largest remaining wet prairie remnant in public ownership in Missouri. Wet prairie is an important habitat for several State-listed threatened and endangered species, including the Massasauga rattlesnake. This alternative would attempt to expand the present wet prairie, restore the wet prairie vegetation, and reintroduce fauna found prior to the mid-1840's in the Missouri River ecosystem. The restored area would be a showcase example of the historic conditions, particularly relevant on the 200th anniversary of the Lewis and Clark expedition, and would be of great interpretive value to visitors.

Some of the current management practices would be altered or eliminated. Prescribed burning



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frequencies and seasons would be changed to more accurately reflect natural burns. Active water level manipulations would be eliminated and the natural seasonal ebb and flow via watershed runoff would be encouraged. Farming and vegetative habitat management (mowing, haying, chemical spraying) would be eliminated to permit natural ecological successional changes to occur.

Alternative C: Enhance Public Use/ Current Resource Management Level

Under this alternative, the six priority wildlife-dependent uses highlighted in the Refuge Improvement Act would be promoted and enhanced. These uses include: hunting, fishing, environmental education and interpretation, wildlife observation, and wildlife photography. Environmental education efforts and outreach would be stepped up considerably. Additional facilities would be developed on the Refuge to accommodate increased public use.

Alternative D: Optimize Resource Management With Enhanced Pub- lic Use (Preferred Alternative)

This alternative seeks to maximize wildlife habitat and population management practices and

opportunities without adversely impacting current levels of wildlife-dependent recreational opportunities. Compared to Alternative A, a greater effort would be made toward conserving, managing, and restoring habitats native to the Lower Missouri River ecosystem, both on Refuge lands and FSA easements within the management district and watershed. Management would include additional wetland, riparian, and native grass development and enhancement.

Increased biological monitoring would evaluate wildlife responses to management efforts and track population trends of species of concern, including Massassauga rattlesnakes and grassland birds. We would seek to quantify the need and benefit of various approaches to reducing sedimentation and improving water quality. Additional efforts would be made to accommodate all migratory bird species, such as fall migrating shorebirds. Snow Goose populations would be actively managed, which for the immediate future means participating in the mid-continent efforts of population reduction.

All wildlife-dependent recreational opportunities would continue as in Alternative A, but with a slight additional effort exerted to increase visitation or additional public use

activities and an improvement in the quality of services and facilities.

Alternative E: Intensive Wetland Management With Extreme Measures to Combat Sedimentation

This alternative would selectively emphasize the creation and maintenance of the widest possible variety of wetland habitats (e.g. lacustrine, palustrine, moist soil, green tree, riverine, bottomland hardwoods, wet meadows, exposed flats, and others) with the intention of attracting highly diverse populations of aquatic wildlife. Targeted wildlife species would include waterfowl (e.g., ducks and geese), shorebirds and wading birds, aquatic animals and plants that are of high interest to the public (e.g., otters), and species that require additional conservation (e.g., rare, threatened or endangered species of aquatic plants and animals).

The Refuge would be maintained as a showcase of Lower Missouri River Ecosystem wetland habitats and aquatic wildlife diversity. The value of this alternative would include conservation/preservation, public education, and scientific research. Outreach and education activities would focus on helping people understand the importance of wetlands. The alternative would include demonstration areas to teach the public how to create and maintain wetlands.

Under this alternative, visitor numbers and programs would be restricted to minimize conflicts with the wetlands management and aquatic biodiversity conservation goals.

Under this alternative, extreme measures may be necessary to maintain various habitat types. These measures might include dredging and constructing dikes and water control structures.

Proposed Management Direction

Managing a national wildlife refuge demands that we chart a long-term course that will ensure the health and persistence of wildlife and habitat species. There may be too many variables to plot a course into the future that is as precise as a road map, but we can at least note a few landmarks to steer by. Through this comprehensive conservation plan, which has been developed with the participation of the State of Missouri and other partners, and with participation by neighbors and other interested people, we have defined goals that will guide Squaw Creek NWR for the next 15 years.

The management direction proposed in the Draft CCP and summarized here reflects the preferred alternative, Alternative D (Optimize Resource Management With Enhanced Public Use).

Section 4.2 of the Draft CCP details goals for the Refuge, the objectives we have identified for achieving those goals, and the strategies by which we mean to achieve our objectives. In this summary, we provide a brief overview of our plans for Squaw Creek NWR.

Habitat

In considering the Refuge's future, we are mindful that the Refuge was established to provide a resting, breeding and feeding ground for migratory birds and other wildlife. We intend to accomplish this by providing a diversity of habitats, with particular emphasis on wetlands (Figure 3, page 13). We will maintain uplands that create diverse habitats. We will manage forest land to benefit migratory songbirds and to benefit threatened and endangered species, other migratory birds, and indigenous species. We will work with farm



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program cooperators to convert cropland to grassland or woodlands. By continuing our work with private landowners using existing programs, we will contribute to reducing erosion and sedimentation and improving the quality of surface runoff waters.

Fish and Wildlife

We will learn more about annual peak populations of wildlife using the Refuge so that we better understand species' needs and the Refuge's ability to meet those needs. We will maintain waterfowl use day levels at a minimum of 5 million, however we will assist in international efforts to reduce the mid-continent population of Lesser Snow Geese. This will include reducing cropland on the Refuge as well as offering a spring Snow Goose hunt. We will better manage deer populations to improve the quality of Refuge habitat. We will seek Refuge designation as a Western Hemispheric Shorebird Reserve Network, which would contribute to funding initiatives and gain

Plan Implementation

Personnel

Currently the staff of Squaw Creek NWR consists of seven positions: refuge manager, refuge operations specialist, administrative technician, wildlife biologist, a park ranger, a maintenance mechanic, and tractor operator.

As the Refuge activities have expanded over recent years and Refuge visitation has increased, it has

international recognition of the Refuge and its work to conserve indigenous species. We will maintain bottomland cottonwood forest areas in an effort to support Bald Eagles during fall and winter migration periods. We will maintain habitat that is critical to the Eastern Massasauga rattlesnake and Least Bittern.

Wildlife-dependent Recreation, Environmental Education and Interpretation

Our programs will inspire people to care about Squaw Creek NWR, natural resources, and the environment. Toward that end, we will focus on improving the quality of the visit. To accomplish this, we will design and implement interactive programs that meet Service standards and bring existing facilities up to Service standards. We will improve our orientation maps and signage. We appreciate traditional Refuge visitors and want them to continue coming to Squaw Creek NWR, and we will reach out to diverse groups of people who are not traditional Refuge visitors. Volunteers play a critical role at the Refuge, and we want to strengthen our relationships with volunteers (and through them, the community) by drawing more people to contribute their time and talent to the Refuge. We will work to strengthen our relationship with Friends of Squaw Creek National Wildlife Refuge.

become difficult to efficiently run the Refuge to meet the demands of the resources as well as the public. To meet all of these needs, our plan is to fill the currently approved but vacant 0.5 full-time-equivalent (FTE) maintenance position and add a 0.5 FTE seasonal clerical position (permanent seasonal or intermittent), add a full-time law enforcement officer, and add a full-time fire technician. The Refuge would

continue to seek the assistance of interns to work in the headquarters greeting visitors.

New and Existing Projects

The Draft CCP outlines an ambitious course of action for the future management of Squaw Creek NWR. It will require staff and funding commitments to actively manage the wildlife habitats and improve public use facilities. The Refuge will continually need appropriate operational and maintenance funding to implement the objectives in this plan.

The following list describes the highest priority Refuge projects, as chosen by the Refuge staff. A full listing of unfunded Refuge projects and operational needs can be found in Appendix F of the Draft CCP.

- Improve moist-soil/wetland vegetation (seasonal tractor operator)
- Improve visitor services/out-reach environmental education
- Restore Loess Bluff/upland grasslands
- Improve visitor services - interpretation and auto-tour route
- Expand outdoor classroom facilities
- Revise Refuge leaflets
- Provide access east of Davis Creek
- Law enforcement equipment
- Improve visitor services operating and maintenance

Partnership Opportunities

Partnerships have become an essential element for the successful accomplishment of Squaw Creek NWR goals, objectives and strategies. The objectives outlined in the CCP need the support and the partnerships of federal, state and local agencies, non-governmental organizations and individual citizens. Squaw Creek NWR will continue to seek creative partnership opportunities to achieve its vision for the future. Partnerships will focus in particular on volunteers, Friends of Squaw Creek NWR, governmental and non-governmental organizations, and researchers working on the Refuge.

Monitoring and Evaluation

The direction set forth in this CCP plus specifically identified strategies and projects will be monitored throughout the life of this plan. Periodically, the Regional Office will assemble a station review team to visit Squaw Creek National Wildlife Refuge and evaluate current Refuge activities in light of this plan. The team will review all aspects of Refuge management, including direction, accomplishments and funding. The goals and objectives presented in this CCP will provide the baseline from which this field station will be evaluated.



Frank Durbian

Where You Can Find the CCP

You can see the complete Draft CCP in a number of places. If you have access to the Internet, you can find a link to the draft Plan at this web address: <http://midwest.fws.gov/planning/squawcreek/index.html>

Paper copies and compact disks of the draft Plan are also available in a limited supply. Please call Conservation Planning toll free at 1-800-247-1247 to request a paper copy or a compact disk. Copies of the draft CCP are also available for viewing at local libraries including:

- Mound City Public Library
- Maryville Public Library
- Oregon Public Library
- Rolling Hills Consolidated Library, Savannah
- Rolling Hills Consolidated Library, St. Joseph

St. Joseph Public Libraries, including:

- Downtown Library
- Carnegie Library
- Washington Park Library
- East Hills Library

Tell Us What You Think

We invite you to review the Plan and tell us what you think. Your comments on the draft Plan will help us write a final plan that is both visionary and practical.

You are also invited to meet with Service staff to discuss the draft CCP. An open house is scheduled on August 4, 2004, from 3 p.m. to 8 p.m. at the Refuge Headquarters, which is located at Highway 159 South near Mound City.

Written comments are welcome, and comments can also be sent through the Service's website for the Squaw Creek NWR planning project at the address above. In order for us to consider your comments when writing the final plan we need to receive them by August 27, 2004. However, comments received after that date are welcome and will be considered in future management decisions.

Address correspondence to Ron Bell, Refuge Manager, at:



U.S. Fish & Wildlife Service

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Squaw Creek NWR
Attn: CCP Comment
PO Box 158
Mound City, MO 64470