

# Chapter 4: Management Direction

## Operational Policies

### Area Designations

*Background:* Twice since the establishment of the Refuge, the Service has published its land use policy in the Federal Register. These documents used the concept of dividing the Refuge into three areas and describing the types of use that would be considered within a particular area. This policy was last published in the Federal Register on September 6, 1961. It called for using Area I for “various forms of recreation, including public hunting and fishing in accordance with State laws, picnicking, boating, swimming, and similar activities;” Area II for “industrial purposes;” and Area III “for use and administration as a public recreation area on which group recreation, group camps and private cabin or cottage site developments on lands zoned for those purposes.”

Since the publication of the policy described above, Congress has passed several laws governing the management of the National Wildlife Refuge System. The most recent, the National Wildlife Refuge System Improvement Act of 1997 (Act) sets forth guiding principles for management of all national wildlife refuges, such as wildlife-dependent recreation having priority over non-wildlife-dependent recreation. It challenges the managers of Crab Orchard National Wildlife Refuge to balance Refuge purposes, which are “...conservation of wildlife and for the development of agriculture, recreation, industrial and related purposes...,” with the Refuge System mission of “administering a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife and plant resources and their habitats...” The Act states that: “... if a conflict exists between



*U.S. Fish & Wildlife Service*

the purposes of a refuge and the mission of the System, the conflict shall be resolved in a manner that first protects the purposes of the refuge, and, to the extent practicable, that also achieves the mission of the System.”

*Policy:* With this comprehensive conservation plan, the Service is attempting to balance its management responsibilities across all portions of the Refuge. The concept of classifying uses of the Refuge into Areas I, II and III will be dropped. Only the industrial area of the Refuge, formerly known as either Area II or the Closed Area, will retain the designation of “restricted use area” because of safety and security concerns.

The safety and security concerns are associated with property protection, contaminants and the storage of explosive materials. The warehouse area on the east end of Ogden Road (Area 7) will be closed to the general public, thereby precluding access to Blue Heron Pond for recreational fishing.



U.S. Fish & Wildlife Service

Wildlife management is a major focus for all lands encompassed by the boundaries of Crab Orchard NWR.

### Camping Length of Stay

*Background:* People camped near Crab Orchard Lake before the Refuge was established. In the early days of the Refuge, camping was allowed throughout the open areas of the Refuge. However, the dispersed camping caused unacceptable litter and resource damage. In order to minimize the problems, four concession-operated campgrounds were constructed and camping was permitted only in the campgrounds. Crab Orchard Lake Campground began operation in 1964. Since then, the Refuge campgrounds have been operated by both concessionaires and the Service at different times.

Refuge regulations have not limited the length of stay for campers. By not limiting the length of stay, campers have been able to occupy a site for an entire season. The result is that sometimes families on a short vacation or a weekend visit have limited opportunity to camp in the most desirable sites near the water. Some people who have occupied sites for the entire season have brought in equipment and material that have created an atmosphere more typical of a permanent trailer park than a campground. The lack of a length of stay regulation is unusual in public campgrounds. In order to provide a more equitable opportunity to stay in desirable camping sites, we will establish a maximum length of stay at all Refuge campgrounds.

*Policy:* We will limit the length of stay at Refuge campgrounds to 14 nights comparable with other Federal and State campgrounds in the area. For the first 2 years, approximately one-half of the campsites will remain available for long-term camping and the other half for stays up to 14 days maximum. The second 2-year period will permit up to one-third of campsites to be available for 28 days and the remaining two-thirds will be limited to 14-day maximum stays. Finally, beginning in the fifth year, a 14-day maximum stay will apply to all campsites. At the end of a camping stay, we will require persons to remove all camping equipment from the campground for a minimum of 48 hours. Personal property such as trailers or recreational vehicles may not be stored in the campground during this 48-hour period. In addition, a reservation system will be phased in for Refuge campgrounds.

### Group Camps

*Background:* Refuge policy that immediately followed establishment of the Refuge had provisions that permitted group recreation, group camps and private cabin or cottage site development on lands zoned for that purpose. The areas chosen for group camps were along the shoreline of the proposed Little Grassy Lake. Interest from organizations on how to establish a group camp in this area was shown as early as December 1947.

The Service prioritized the availability of this opportunity for planned group camping with the policy of first serving strictly youth camping groups, second youth/adult church camp educational programs and last fraternal organizations. In 1950, the Refuge began reviewing applications for group camping from a number of organizations. The Service issued several group camping leases to organizations such as: The Boy Scouts of America, the Girl Scouts, the Educational Council of 100 Inc., Pioneer Communications Club, Independent Order of Odd Fellows, The United Methodist Church, The Presbyterian Church and others. Many of these organizations began using the area in 1952. Today there are four group camps still operating on the Refuge: Pine Ridge Camp (Boy Scouts), Camp Cedar Point (Girl Scouts), Camp Carew (Presbyterian Church), and the United Methodist Church Camp.

*Policy:* Group camps will continue with the requirement that they provide environmental education as specified in current agreements. The infrastructure associated with the existing camps will not expand beyond current square footage occupied by

**Table 28: Recreational Entrance Fees and Federal Passes That Will Permit Entry**

Fee Option	Cost	Eligibility	Allows Entry to...	Validation Period
Daily Fee	\$2/vehicle	Anyone	Crab Orchard NWR	1 day
Weekly Fee	\$5/vehicle	Anyone	Crab Orchard NWR	7 consecutive days
Commercial bus	\$20	For buses up to 20 passengers	Crab Orchard NWR	1 day
Refuge Annual <sup>1</sup>	\$15/vehicle	Anyone	Crab Orchard NWR	1 year (July 1 - June 30)
Duck Stamp	\$15	Anyone	Any national wildlife refuge	1 year (July 1 - June 30)
Golden Eagle	\$65	Anyone	Any federal fee area	1 year from month of purchase
Golden Age	\$10	Persons 62 years or older	Any federal fee area	Lifetime
Golden Access	Free	Anyone who is permanently disabled	Any federal fee area	Lifetime
Hologram <sup>2</sup>	\$15	Anyone holding a National Park Pass	Any federal fee area	1 year from month of purchase
Daily boat launch fee	\$2/boat	Anyone	Crab Orchard NWR	1 day
Daily boat launch fee	\$2/boat	Anyone	Crab Orchard NWR	1 day
Weekly boat launch fee	\$5/boat	Anyone	Crab Orchard NWR	7 consecutive days
Annual boat launch <sup>1</sup>	\$10/boat	Anyone	Crab Orchard NWR	1 year (July 1 to June 30)

1. Additional passes for vehicles and boats may be purchased for \$5.

2. The National Park Pass (\$50) can be upgraded through the purchase of a \$15 Golden Eagle hologram. The Golden Eagle hologram can be affixed to the Park pass to allow for entrance into all federal fee areas. The National Park pass will not be available at the Refuge, but the hologram can be made available.

the camps. The camps will be assessed a fee for use of federal lands. Because the use authorized under the agreements includes environmental education with no profit gained by the camps, the fees will be minimal administrative and use fees. If an organization decides to no longer operate their camp, the Refuge will determine if the site should be closed or leased to another organization based on Refuge's environmental education goals, the purpose and mission of the organization wishing to occupy the camp, the condition of the facilities and existing National Wildlife Refuge System policies.

## Recreational Fees

*Background:* Entrance fees were implemented in 1988 under the authorization of the Emergency Wetland Resource Act of 1986. The entrance fee program admitted anyone holding a permit and accompanying passengers in their vehicle to the Refuge. In 1997, under authorization of the Omnibus Consolidated Rescissions and Appropriations Act of 1996, the entrance fee program was modified to a recreation use fee program. The user fee pro-

gram requires all vehicles and boats using the Refuge to have a valid fee decal. In evaluating the use fee program as part of the comprehensive conservation planning process, we recognized that the current program does not fairly implement the intent of the Federal Demonstration Fee Program.

*Policy:* We will implement a recreational fee program that is comparable to other fee programs within the Service. These changes will be consistent with the new Federal Lands Recreation Enhancement Act and increase convenience for the visiting public. The Refuge will have an entrance fee as well as an expanded amenity recreation fee. Federal Duck Stamps, America the Beautiful Passes, and Crab Orchard Refuge annual, weekly and daily passes will permit entry to the Refuge. An expanded amenity recreation fee will be charged in addition to the entrance fee for using boat launching facilities and participating in quota hunts. Table 28 summarizes recreational fees.

## Fishing Tournaments

*Background:* Five fishing tournaments are held each year on the Refuge's three lakes under special use permits. Devils Kitchen Lake and Little Grassy Lake each host one tournament. Crab Orchard Lake hosts three tournaments. The tournaments are well established and require minimal assistance from Refuge staff, although Refuge and Illinois Department of Natural Resources officers do conduct spot checks for violations during the tournaments. Anglers and biologists have expressed concern over reduced fish populations because of post-release mortality and the lack of vegetation for spawning bass.

*Policy:* The five current fishing tournaments will continue on the Refuge's three lakes. However, if any of these five organizations decide to discontinue a tournament, the event will be eliminated and not replaced in the future. We will continue to work with tournament organizers to reduce post-release mortality.

## Fish-offs

*Background:* The three lakes receive many visits from fishing clubs hosting events called "fish-offs." A fish-off is defined as an organized club fishing event having 20 boats or fewer. Recreational anglers and biologists have expressed concern over reduced fish populations and catch rates as a result of fishing pressure on Refuge lakes. In the past, the total number of fish-offs has not been limited, and as many as 95 Refuge-authorized fish-offs have been held in a single year, in addition to unauthorized events.

*Policy:* Organizers of fishing events must obtain a fish-off use permit. The permit allows the organizer to have one fish-off per lake, per year. The total number of fish-offs allowed on the Refuge will be determined annually by the Refuge Manager. There is a \$35 charge for the permit and the organizer must follow terms and conditions of the permit.

## Recreational and Technical Rock Climbing

*Background:* Crab Orchard NWR is not typically considered a climber's destination, but some demanding and varied rock climbs can be found in the southern portions of the Refuge. Over the years Refuge visitors have inquired about climbing, but climbing has never been officially permitted. Rock

climbing has occurred in the Devils Kitchen and Little Grassy areas. The Refuge has in the past discouraged rock climbing activities such as jumping and diving from the rocks of Devils Kitchen Lake by not permitting swimming in the lake and by closing the area below the Crab Orchard Dam spillway to public access. Climbing opportunities can be found at nearby Giant City State Park.

*Policy:* Recreational and technical rock climbing will not be permitted on the Refuge. This includes free-style rock climbing, rappelling and technical rock climbing. (Also see the rock climbing discussion in the Record of Decision, Appendix A.)

## Scuba Diving

*Background:* Limited opportunities for scuba diving do exist on Crab Orchard NWR, however this activity has never explicitly been permitted. Some visitors have participated in this activity under the assumption that it was allowed. Due to the relatively shallow and turbid condition of Crab Orchard Lake and the fact that swimming is prohibited on Devils Kitchen Lake, Little Grassy Lake is the only location where a visitor could reasonably expect to participate in this activity.

*Policy:* Due to the fact that swimming is already allowed in Little Grassy Lake, the lake is already heavily used by youth camps, and it is a popular fishing destination, we will prohibit scuba diving on the Refuge to reduce conflicts between these user groups.

## Trapping

*Background:* Opportunities for trapping do exist on Crab Orchard NWR. In the past, trapping has been loosely regulated through special use permits in areas designated by the refuge biologist. A maximum number of 50 recreational trapping permits had been determined, but due to changes in culture and markets, that number does not reflect actual demand.

*Policy:* Limited trapping will be allowed in designated areas of the Refuge through special use permits. Carefully controlled trapping is considered a management tool, and contributes to the habitat and wildlife management goals of the Refuge. In some cases it is the only means by which nuisance wildlife can be removed. The activity will be limited in scope to areas of the Refuge that are identified by the Refuge biologist, and carefully regulated through the use of special use permits.

## Dog Training

*Background:* Dog field trials were a part of the Crab Orchard Creek Project before the establishment of Crab Orchard National Wildlife Refuge. Training of dogs has occurred sporadically on the Refuge, and is regulated through special use permits. In addition, dogs are allowed on the Refuge, provided they are leashed. Hunting is a priority public use and supports the recreation purpose for which the Refuge was established, and well trained hunting dogs contribute to this activity by locating and retrieving game that may otherwise be lost.

*Policy:* The training of dogs that are to be used for hunting will be allowed in designated areas of the Refuge through special use permits. This use does not include field trials or commercial/professional dog training, which remains prohibited. This use also does not include training of dogs from sunset to sunrise, also known as “running” furbearers with dogs, which will also be prohibited.

## Boundary Modification

*Expand authorized Refuge boundary to include additional lands contiguous with the current Refuge boundary.*

*Background:* The Washington Office of the Service approved the study of potential additional Refuge lands in 1990. The Refuge did not pursue the study of additional lands until the CCP process. The CCP planning effort was the logical time to re-examine all management and land protection issues related to the Refuge. So, during the CCP effort we again looked at the possible need to adjust the boundary of the Refuge. Land acquisition and subsequent habitat management will enhance the purposes of the Refuge and offer additional protection to existing lands as development accelerates along Refuge boundaries.

The boundary modification, which was approved as part of the EIS/CCP, is depicted in Figure 25.

## Wildlife Conservation Goals

Several of the objectives under these goals refer to changing acreages of land cover on the Refuge. Figure 26 and Figure 27 show projected land cover in 15 years and 100 years. Table 29 on page 70 compares the land cover in 2000 with the projected land cover in 2021 and 2106. Given the uncertainties in future conditions, the acreages are approximate.



U.S. Fish & Wildlife Service

### Canada Geese Goal

*Provide enough food for wintering Canada geese to support 6.4 million goose-use-days annually, in support of the Mississippi Valley Population Canada Goose Management Plan.*

*Background:* When established, the Refuge was recognized as being important to providing habitat for wintering Canada Geese. The Refuge was also established with an agricultural purpose. The agricultural purpose and supporting wintering Canada Geese are interrelated. The importance of wintering refuge habitat to the Mississippi Valley population of Canada Geese has been recognized in population management plans. The Refuge’s approach to meeting the goal of 6.4 million goose-use-days is to provide relatively large amounts of a diverse array of food-producing habitats. This approach provides relatively high assurance that even if a major habitat fails to provide, sufficient foods will be available in other habitats. The Refuge has about 4,500 acres of cropland, 1,000 acres of pasture, 700 acres of hay fields, and 450 acres of moist-soil units commonly used by geese (see Figure 7 on page 22). Other goose management activities include seasonal closure to boating on the east end of Crab Orchard Lake and fall mowing around selected ponds.

#### Objective 1

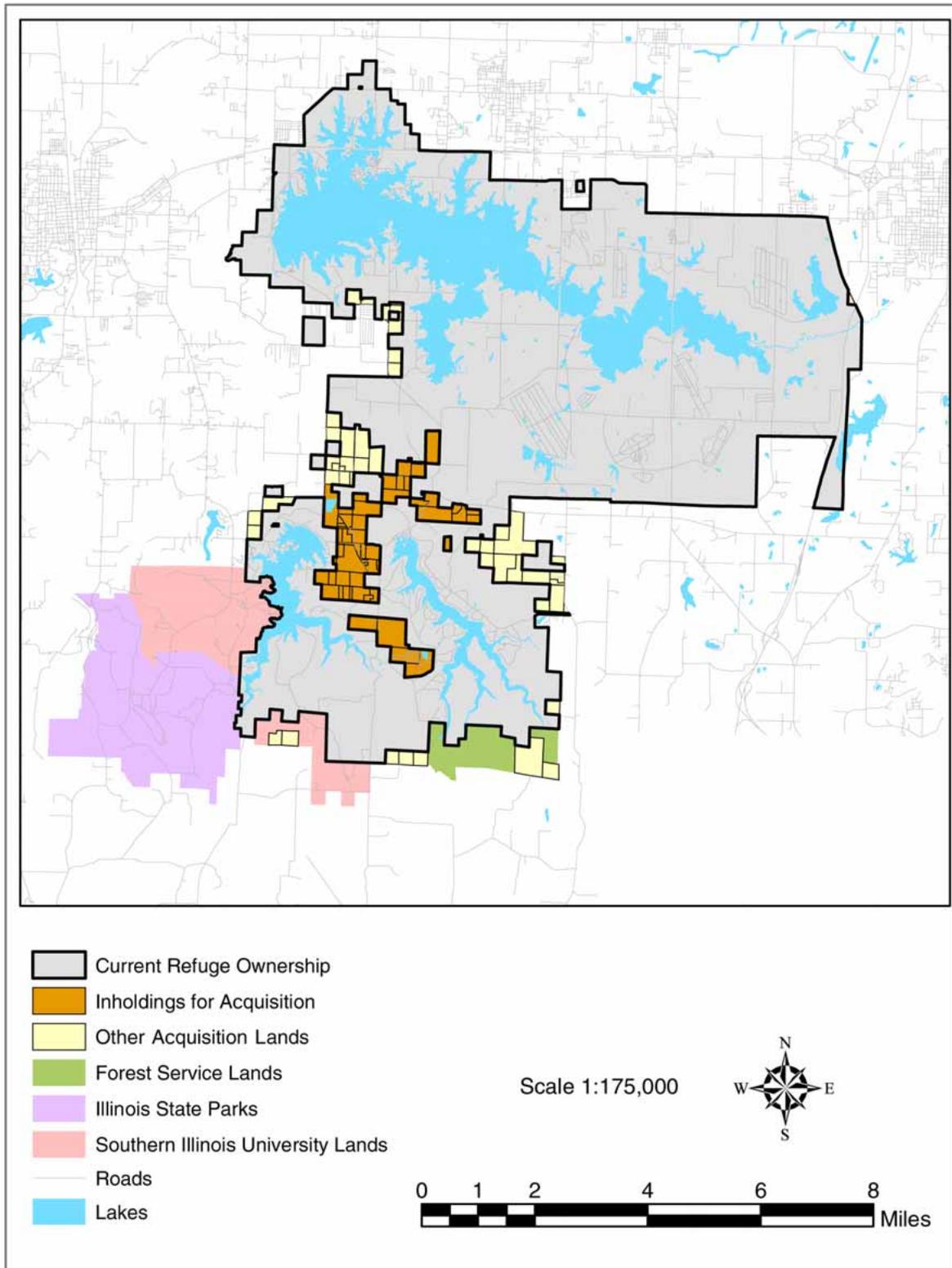
Provide enough food for wintering Canada Geese to support 6.4 million goose-use-days.

#### Strategy

*Contributing Refuge Operating Needs System (RONS) projects: 02006, 020007, 02008, 02009*

1. Maintain 4,300 acres of cropland in agricultural production (see Figure 26). Manage 450 acres of moist-soil units. Continue fall mowing

**Figure 25: Crab Orchard NWR Approved Boundary Modification and Adjacent Public Lands**



**Table 29: Areas of Land Cover at Crab Orchard NWR in 2000 and Acres Projected for 2021 and 2106, With Change from 2000 Shown in Parentheses**

Land Cover	2000	2021	2106
Agricultural Field	4,540	4,412 (-128)	4,412 (-128)
Aquatic Herbaceous Marsh	365	365 (0)	365 (0)
Bald-cypress Plantation, Swamp Forest	44	44 (0)	44 (0)
Buttonbush Swamp Shrubland	81	81 (0)	81 (0)
Cattail Marsh	25	25 (0)	25 (0)
Common Reed Marsh	7	7 (0)	7 (0)
Developed Land	1,138	1,138 (0)	1,138 (0)
Early Successional Oak Forest (reforested)	5	0 (-5)	0 (-5)
Eastern Red-cedar, Mixed Hardwood Forest (old field)	1,006	1,006 (0)	0 (-1,006)
Eastern Red-cedar Forest (old field)	71	71 (0)	0 (-71)
Fallow Herbaceous Field	1,567	172 (-1,395)	172 (-1,394)
Forest Regeneration Herbaceous Land	168	0 (-168)	0 (-168)
Mixed Hardwood Bottomland Forest	1,907	2,042 (+135)	2,042 (+135)
Mixed Hardwood Upland Forest	18,923	21,148 (+2,225)	25,869 (+6,946)
Open Water	9,082	9,082 (0)	9,082 (0)
Perennial Grass Crops	1,725	1,564 (-161)	1,564 (-160)
Pine Plantation / Mixed Hardwood Forest	1,633	1,633 (0)	0 (-1,633)
Pine Plantation Forest	1,665	1,665 (0)	0 (-1,665)
Restored native Grassland	240	261 (+21)	261 (+21)
Upland Mixed Shrubland (old field)	872	347 (-525)	0 (-872)
Wet Herbaceous Meadow	389	389 (0)	389 (0)
Willow Wet Shrubland	3	3 (0)	3 (0)

around selected ponds. Maintain seasonal closure to boating on the east end of Crab Orchard Lake.

#### **Forest, Early Successional and Grassland Birds Goal**

*Maintain or enhance populations of forest, early successional and grassland birds, with emphasis on priority species, as identified in Partners in Flight Physiographic Area Bird Conservation Plans.*

*Background:* The Refuge has about 25,000 acres of forest habitat. Most of this acreage is in old-field or second-growth hardwood forest cover on upland and bottomland sites. Oaks are keystone species that are essential to a healthy, diverse forest ecosystem in this region. Typically with a lack of disturbance shade-tolerant trees increase in dominance while oaks steadily decrease, and understory diversity is greatly diminished. On many sites timber harvesting, prescribed burning, and other methods of disturbance must occur for oaks to flourish. Past forest

management activities have included prescribed burning and the thinning of hardwood stands to maintain tree health, promote mast production and control species composition. Our management actions will apply these same treatments in order to provide habitat for the full spectrum of native plants and animals with an emphasis on the habitat needs of the resource conservation priority species. No commercial timber harvesting will take place in the Crab Orchard Wilderness or any research natural area.

Studies have shown that forest fragmentation reduces nesting success of migratory birds because of increased nest predation and parasitism. The Refuge has carried out reforestation activities in recent years to reduce fragmentation of forested habitats and retire former agricultural fields and pastures.

**Table 30: Forest, Grassland and Shrubland Bird Species of Conservation Priority**

Forest Birds	Grassland Birds	Shrubland Birds
Acadian Flycatcher	Dickcissel	Bell's Vireo
Cerulean Warbler	Eastern Meadowlark	Blue-winged Warbler
Chuck-will's-widow	Field Sparrow	Field Sparrow
Kentucky Warbler	Grasshopper Sparrow	Loggerhead Shrike
Louisiana Waterthrush		Prairie Warbler
Red-shouldered Hawk		
Whip-poor-will		
Wood Thrush		
Worm-eating Warbler		

The Refuge has about 3,300 acres of pine plantations. Most of the pine plantations were established between 1938 and 1941 by the USDA Soil Conservation Service for the purpose of controlling soil erosion. Pines, which are not native to the Refuge, generally provide lower quality wildlife habitat than native hardwoods. The existing plans call for thinning and prescribed burning pine plantations to encourage the growth of desirable, mast-producing hardwoods.

The Refuge has about 2,500 acres of early successional habitat. Some migratory birds primarily use early successional habitats, such as shrubland and fallow herbaceous fields. Without active management, these habitat types will succeed to forest. These habitat types are identified in Figure 7 on page 22.

Refuge grasslands include pastures (1,000 acres), hay fields (700 acres), and native grasslands (240 acres). Pastures and hay fields provide the majority of the grassland habitat for migratory birds. However, the pastures are relatively poor quality habitat for many migratory birds because they are dominated by fescue, a non-native grass. Prior to 2005, Refuge hay fields were mowed in spring and summer when migratory birds are nesting, which reduces nesting success. The presence of woody vegetation along fence rows and roadsides tends to reduce the value of grasslands for some birds. .

The Refuge has 4,500 acres in the row crop program. The crop rotation is generally corn/soybeans/corn/clover/clover. Grassland birds, such as the dickcissel and eastern meadowlark, use clover fields for nesting habitat. Cooperative farmers commonly mow second year clover to make hay during the nesting season of migratory birds, which reduces nesting success.

The forest, shrubland and grassland resource conservation priority bird species that are expected to benefit from our habitat management are listed in Table 30. These priority bird species are a regional subset of the priority species found in Partners in Flight plans.

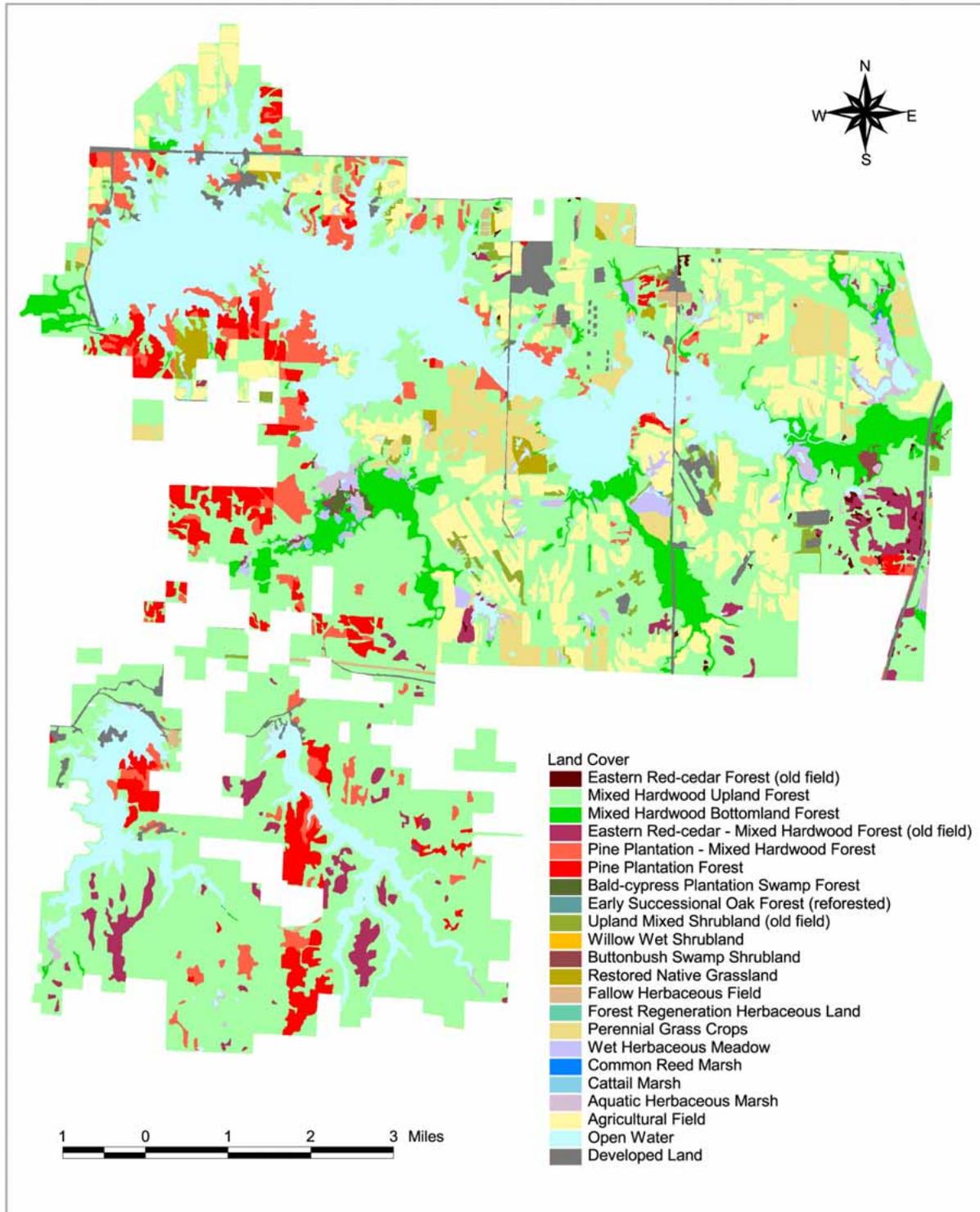
#### Objective 1

Manage forest land to favor oak-hickory forest types on suitable sites with all age classes from seedling stage to old-growth represented. Manage native, shade-tolerant tree species (such as sugar maple) to prevent wide-spread succession to climax forest cover types.

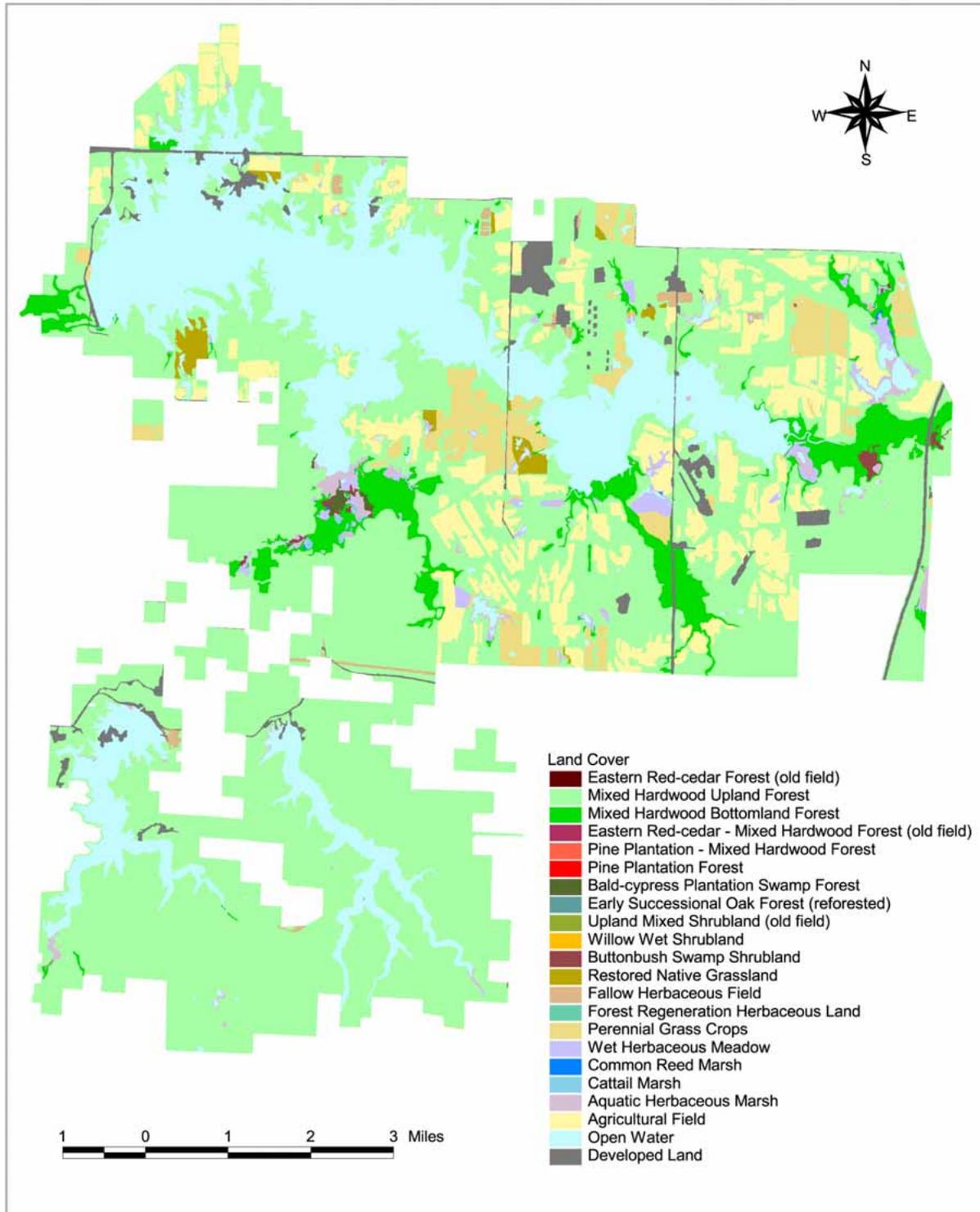
#### Strategies

1. Write and implement a *Habitat Management Plan* following policy in the Fish and Wildlife Service Manual (620 FW 1).
2. Apply appropriate silvicultural treatments to manage forest health, species composition, and age structure. Treatments may include non-commercial forest stand improvement treatments (girdling, cutting, and/or applying herbicide to individual stems), commercial timber cutting (thinnings, improvement cuttings, and regeneration cuttings) and prescribed burning. Forest stand improvement treatments may occur in any forest type (up to 25,000 acres). Commercial timber cutting may occur in any forest type outside the Crab Orchard Wilderness and research natural areas (up to 19,700 acres). Commercial harvest operations are not likely to take place on more than 400 acres annually on average, half of which will be considered regeneration cuttings. Our preferred regeneration technique is the shelterwood method. More specifically, the shelterwood method with reserves will be used in hardwood (and

**Figure 26: Land Cover of Crab Orchard NWR, Projected Conditions 2021**



**Figure 27: Land Cover of Crab Orchard NWR, Projected Conditions 2106**



pine) stands where some hardwoods will be left standing following the final removal cutting. Prescribed fire may be applied in upland forest (up to 23,000 acres of hardwood and pine types), but not in bottomland forest.

3. Reforest available open sites located outside of the two large forest blocks (see Objective 2 below) by planting native hardwoods, with preference given to oaks and hickories, to reduce forest fragmentation. Examples of such sites would be small agricultural fields (or portions thereof) no longer being farmed, abandoned industrial areas, abandoned rights-of-way (roads, powerlines, and pipelines), and remediated contaminant areas.
4. Control exotic, invasive plants through integrated pest management practices.

#### **Objective 2**

Manage two portions of the Refuge as large forest blocks to benefit area-sensitive forest birds. The first area (about 13,000 acres) extends from the southern end of Grassy Bay east to Caney Creek, and south including the wilderness area. The second area (about 1,700 acres) extends from the federal prison north and includes the Crab Orchard Creek bottomlands. This will include about 490 acres of reforestation of open habitat to consolidate large blocks of forest habitat.



Glenn Smart

#### *Strategy*

*Contributing RONS projects: 02001, 97001, 97009, 97008, 98027*

1. Reforest about 290 acres of crop fields, 130 acres of fallow fields, and 90 acres of perennial grasslands. This may include site preparation, planting a cover crop, planting tree seedlings, and weed control treatments.

#### **Objective 3**

Accelerate succession of all (about 3,300 acres) pine plantations to native hardwood forest.

#### *Strategy*

*Contributing RONS projects: 97001, 97008, 02001, 98027*

1. Thin pine plantations to promote establishment and growth of native hardwoods. In some cases, remove pine overstory to release young hardwoods. Most silvicultural treatments will be conducted under contract by commercial timber harvesting firms. Conduct prescribed burning during the dormant season (November through March) on a 3- to 5-year cycle to enhance habitat conditions and promote desirable hardwood regeneration.

#### **Objective 4**

Maintain about 300 acres in early successional habitat.

#### *Strategy*

*Contributing RONS projects: 02005, 97001.*

1. Use prescribed fire or mechanical treatment (mowing, discing) to disturb about 200 acres every 3 to 5 years. Add about 100 acres of 30-foot-wide borders of native warm-season grasses in row crop fields in the open portion of the Refuge.

#### **Objective 5**

Maintain 260 acres of native warm-season grassland.

#### *Strategy*

*Contributing RONS projects: 02008, 97001.*

1. Prescribed burn all native warm-season grasslands on a 2- to 3-year cycle to favor grassland vegetation and control undesirable plants. Apply mechanical or herbicide treatments to control vegetation, when needed.

**Objective 6**

Maintain 1,000 acres of pasture, 700 acres of hay fields, and about 1,600 acres of clover fields with increased emphasis on habitat quality for grassland birds.

*Strategy*

*Contributing RONS projects: 02008, 02002, 97001, 02007, 02009.*

1. Remove 124 acres of linear forest habitat and 8 miles of hedge rows. Install fences to create paddocks within pastures to enable greater control of grazing intensity. Convert fescue pastures to other cool-season and native warm-season grasses by preparing the site and reseeding. The typical Refuge pasture will become three or four paddocks with a paddock of cool-season grass and two or three paddocks of native warm-season grasses. Cattle will enter the cool-season grass paddock in the spring switch to the warm season grasses in the summer, and move back to the cool season grass in the fall. The native warm season grass will provide the grassland birds with nesting, migration, and winter habitat. Vegetation structure will be managed by the amount of grazing applied to each paddock. Most of the pasture grass will not require fall mowing and will be taller than 6 inches during the winter. All mowing of hay fields, pastures, and clover fields will take place after August 1.

*Rationale for converting pasture fescue:* Tall fescue (*Festuca arundinacea*) is a cool-season, perennial grass native to Europe that is invasive in many natural communities in the U.S. Tall fescue has been planted for forage and soil conservation and now covers more than 35 million acres in the U.S. (Ball et al. 1993). It has become the most abundant or dominant plant in many areas, including the Refuge's grasslands. Most (75-80 percent) tall fescue in the U.S. is infected with a fungus (*Neotyphodium coenophialum*) that produces compounds that are toxic to insects (Breen 1994), small mammals (Coley et al. 1995, Conover 1998), and birds (Conover and Messmer 1996, Madej and Clay 1991). Tall fescue often results in loss of plant diversity (Clay and Holah 1999). Livestock losses related to tall



*U.S. Fish & Wildlife Service*

fescue in the U.S. have been estimated between \$500 million and \$1 billion annually (Ball et al. 1993).

Conversion of tall fescue pastures to native warm-season grasses and cool-season grasses with higher wildlife values will provide several benefits: 1) reduce the abundance of an invasive, non-native species, 2) increase plant diversity, 3) increase plant productivity, 4) improve forage for cattle production, and 5) improve pastures for wildlife production.

**Ducks, Shorebirds, and Other Waterbirds Goal**

*Maintain or enhance populations of ducks, shorebirds, and other waterbirds, with emphasis on priority species, as identified in the North American Waterfowl Management Plan, U.S. Shorebird Conservation Plan, and North American Waterbird Conservation Plan.*

*Background:* The Refuge has several types of habitat that support ducks, shorebirds, and other waterbirds: 9,100 acres of open water in artificial lakes and ponds, 1,900 acres of bottomland forest, and 500 acres of swamps, marshes, and wet meadows. The Refuge manages about 450 acres of these wetlands to encourage the growth of moist-soil plants and aquatic invertebrates to provide food for waterfowl, shorebirds, and other waterbirds.

**Objective 1**

Provide 450 to 500 acres of moist-soil habitat during fall, winter and spring for migrating shorebirds, waterfowl, and other waterbirds.

*Strategy*

*Contributing RONS projects: 02006, 97001.*

1. Construct 150-200 acres of new moist-soil habitat. Maintain dikes and water control structures. Manipulate water levels and vegetation to encourage production of waterfowl foods.

**Threatened and Endangered Species Goal**

*Maintain or enhance populations of federal and, where compatible, state threatened and endangered species that occur at or near Crab Orchard National Wildlife Refuge.*

*Background:* The Bald Eagle is the only federally designated threatened species known to occur on the Refuge. The Indiana bat, which is federally classified as endangered, is known to occur in proximity to the Refuge. Thirty-one state-listed threatened and endangered species inhabit, or have inhabited, the Refuge (see Appendix E). Chapter 3 describes the threatened and endangered species on the Refuge. Section 7 of the Endangered Species Act outlines a mechanism for ensuring that actions taken by federal agencies do not jeopardize the existence of any listed species. We conducted a “Section 7” review concurrent with preparation of the EIS. The memo accompanying the Service’s Programmatic Biological Opinion is included as Appendix J.

**Objective 1**

Assure that federally listed species, state-listed species and federally proposed species and their habitats are protected.

*Strategies:*

1. No disturbance of bald eagles will take place during critical periods within protective zones as described in the Northern States Bald Eagle Recovery Plan (USFWS, 1983). Areas are designated closed through signing and brochures.
2. Forest management activities, such as thinning and prescribed burning, will require close coordination with U.S. Fish and Wildlife Service, Ecological Services personnel. These activities may require standard surveys to determine whether Indiana bats are present in a given forest unit or the activities may be scheduled outside of the season when Indiana bats are likely to use Refuge forests.

**Water Quality Goal**

*Provide and manage for quality of water in streams and lakes at Crab Orchard National Wildlife Refuge.*

*Background:* Natural processes along with various human activities occurring in the watershed affect water quality on the Refuge. Since the Refuge controls only a portion of the watershed, increased efforts to protect water quality both on the Refuge and beyond its boundaries are essential. Urbanization of lands adjacent to the Refuge is likely to have even greater impacts on water quality in the future.

**Objective 1**

Improve the quality of water within the watershed of the Refuge.

*Strategies*

1. Cooperate with Illinois Environmental Protection Agency to monitor water quality. Identify landowners and land uses in the watershed. Provide education and technical assistance to landowners with particularly sensitive riparian areas. Work with municipalities and developers to enhance on-site storm water retention.
2. Work with farmers to establish buffer strips and keep livestock away from streams and ponds. Continue using current soil and water protection measures in the Refuge farm program: use no insecticides, use only Service-approved herbicides, use minimum tillage practices, and use winter cover crops.
3. Continue clean-up of contaminated sites. Ensure Refuge industrial operations conform to prescribed environmental standards.

**Resident Fish and Wildlife Goal**

*Maintain or enhance resident fish and wildlife populations consistent with management activities for federal trust resources in cooperation with the Illinois DNR.*

*Background:* There is a long history of public fishing, public hunting, and management of resident fish and wildlife species on the Refuge.

**Objective 1**

Manage Refuge fisheries with emphasis on mixed-species, warm-water sport fishing.

*Strategy*

1. Continue cooperative management of Refuge fisheries with Illinois DNR. Continue managing fish populations and habitat through activities such as: setting length and creel limits,

seasonal closures of spawning bed areas, habitat enhancements, annual surveys, and fish stocking.

#### **Objective 2**

Manage Refuge resident wildlife populations at levels that allow opportunities for sport hunting of game species.

##### *Strategies*

1. Continue managing the Refuge agriculture program with methods that benefit resident game species, such as: leave up to 25 percent of the corn crop unharvested, plant winter wheat in soybean fields each fall, use low tillage planting techniques, keep fields in clover 2 years out of the 6-year rotation, delay mowing until after August 1, and use no insecticides.
2. Incorporate beneficial practices such as those suggested in the Northern Bobwhite Conservation Initiative: convert cool-season to warm-season grasses and burn and thin pine plantations.
3. Continue controlled hunting for turkey and deer in the restricted use portion of the Refuge.

## **Recreation/Public Use Goals**

### **Hunting, Fishing, Wildlife Observation and Photography, Interpretation and Environmental Education Goal**

*Hunters, anglers, viewers and photographers of wildlife, general visitors, and students enjoy high-quality experiences through a variety of opportunities that promote an understanding and appreciation of the Refuge's natural and cultural resources and their management.*

*Background:* The Refuge System Improvement Act of 1997 identified six wildlife-dependent, priority public uses that should be facilitated on national wildlife refuges if compatible with the purposes of the Refuge. These priority uses, which include hunting, fishing, wildlife observation and photography, interpretation, and environmental education, are compatible and can be facilitated at the Refuge. While all of these uses are provided at the Refuge to an extent, support for some of these uses has been inconsistent and the quality of the experience has been variable. The Refuge can provide high-quality experiences for these priority wildlife-dependent uses through improvement of supporting facilities, programs, and materials over the next 15 years. A high-quality experience includes uncrowded condi-

tions, no conflicts with other users, a reasonable opportunity, and overall satisfaction. Understanding and appreciation of Refuge resources, management strategies, and purposes also contribute to quality of experience and influence visitor enjoyment.

#### **Objective 1**

Increase the quality of hunting opportunities to a level where 75 percent of hunters experience uncrowded conditions, no conflicts with other users, a reasonable harvest opportunity, and satisfaction with their overall experience. Instill a sense of awareness among hunters of the Refuge as a component of the National Wildlife Refuge System and of hunting as a wildlife management tool.

##### *Strategies*

1. In the public hunting area of the Refuge, continue the policy of providing hunting opportunities based on state hunting seasons and state and federal regulations.
2. In the restricted use area of the Refuge, maintain hunting opportunities, by permit, during shotgun deer and spring shotgun turkey seasons. Areas with high concentrations of waterfowl may occasionally be closed during the restricted use area shotgun hunts. Maintain shotgun deer season hunting opportunities for youth and persons with disabilities and, within 3 years of the plan's approval, provide these groups with opportunities for spring shotgun turkey season hunting when populations warrant.
3. Administer goose hunts in the controlled area through an agreement with a partner organization.
4. Over the life of the plan, promote ethical hunting behavior and increase hunter adherence to federal and state regulations through effective informational brochures and signs. Increase the visibility of Refuge law enforcement.
5. Over the life of the plan, enhance public understanding of Refuge hunting opportunities, ethical behaviors, the role of hunting in wildlife management, and the Refuge as a component of the National Wildlife Refuge System by increasing the quality of maps, signs, and brochures.



Bob Etzel

### Objective 2

Increase the quality of fishing opportunities to a level where 75 percent of anglers experience uncrowded conditions, no conflicts with other users, a reasonable harvest opportunity, and satisfaction with their overall experience. At least 75 percent of anglers understand the issues, strategies, and policies involved in Refuge fisheries management and conservation.

#### Strategies

1. In the public fishing areas, continue the policy of providing fishing opportunities based on state and federal regulations.
2. Continue to allow tournaments and fish-offs on the Refuge. Continue current policies on limited closures of Refuge waters east of Wolf Creek Road.
3. Continue to provide bank and boat fishing opportunities in accordance with state and federal regulations. Maintain Refuge boat ramps, fishing piers, and parking facilities. Study the feasibility for and construct accessible fishing facilities at Little Grassy and Devils Kitchen lakes within 4 years of the plan's approval.
4. Over the life of the plan, promote Refuge fishing opportunities and encourage conservation practices, such as catch-and-release fishing, through the development and maintenance of high-quality maps, signs, brochures and the Refuge web page.
5. Ensure that the fishing public clearly understands the fish consumption advisories for Crab Orchard Lake through signs and brochures.

6. Over the life of the plan, provide insight to anglers regarding Refuge strategies, issues, and policies for fisheries management and conservation by redesigning and developing more effective informational signs and brochures. Increase angler awareness of the Refuge as a component of the National Wildlife Refuge System by improving the quality and content of maps, signs, and brochures.

### Objective 3

Ensure that viewing and photography opportunities meet the needs of 95 percent of participants. Establish and maintain viewing and photography opportunities for all major Refuge habitat types and optimum seasons.

#### Strategies

1. Within 2 years of the plan's approval, develop an annual observation/photography fact sheet for the Refuge that will include a calendar of established tours, programs, and events; information on identified and recommended viewing and photography areas; guidelines to enhance viewing enjoyment; and a Refuge map delineating trails, blinds, platforms, and identified viewing areas.
2. Continue popular, established programs and tours like the October Discovery Auto Tours, January Eagle Tours, and Spring Wildflower Walks that enhance visitor experience, bring visitors in closer proximity to resources, and provide optimum seasonal opportunities for observation and photography and continually evaluate these programs for effectiveness.
3. Within 2 years of the plan's approval, improve the existing photography/observation blinds and platforms by adding camouflage as needed to enhance viewing opportunities. Evaluate location of existing blinds and platforms and move as needed. Position interpretive and identification panels in or near blinds and platforms to promote understanding and appreciation of Refuge resources. Enhance panels to promote awareness of the Refuge as a component of the National Wildlife Refuge System.
4. Within 5 years of the plan's approval, evaluate need for and add additional blinds/platforms, including interpretive and identification panels, where and if needed to ensure observation and photography oppor-

tunities in all major Refuge habitat types. Maintain all identified viewing and photography sites.

5. Over the life of the plan and in cooperation with other partners, encourage utilization of the Refuge for birding and other wildlife observation through development of informational materials, programs, trails, tours, and special events. Promote the Refuge as a site for quality wildlife observation and photography through participation in selected community and regional birding, nature, and photography festivals and events.
6. Within 8 years of the plan's approval, identify and create a Refuge birding trail that may include enhancement and coordination of existing trails, viewing areas and signs, and creation of a birding trail brochure and map.
7. Over the life of the plan, expand the Refuge web site to promote wildlife observation and photography. Include updates on Refuge and area sightings of rare birds and other wildlife; profiles of selected seasonally-occurring and resident species; suggested optimal viewing times and locations; and current Refuge programs, facilities, tours, and other opportunities for observation and photography.

#### Objective 4

Increase the effectiveness of the Refuge interpretive program so that 70 percent of visitors gain a better understanding of three primary concepts:



*U.S. Fish & Wildlife Service*

- (1) the value and unique purposes of the Refuge,
  - (2) the Refuge as a component of the national network of refuges, and
  - (3) the significance and mission of the National Wildlife Refuge System.
- Heighten awareness of conservation and stewardship concepts. Encourage visitors to adopt ethical behaviors and to take positive actions that support Refuge goals and the Refuge System mission.

#### *Strategies*

1. Within 3 years of the plan's approval, develop the interpretation portion of the Visitor Services Plan outlining a comprehensive, multi-faceted approach emphasizing selected themes and key Refuge resources. Themes will be selected based on importance to Refuge and System goals and relevance to surrounding communities. All interpretive materials, tours, and programs will focus on one or more of these Refuge themes, along with the three basic concepts of the Refuge and Refuge System. Refuge interpretive themes may be in a storyline form that includes three or more themes. Themes may include: Exploring the Diversity of Wildlife, Understanding the Past, Protecting the Balance, and Communicating Visitor Opportunities.
2. Within 4 years of the plan's approval, renovate and replace damaged and outdated interpretive and information panels on Refuge kiosks, wayside exhibits, trails, ramps, structures and other facilities. Ensure all panels comply with Service standards.
3. In cooperation with Refuge volunteers and other partners, conduct a variety of high quality interpretive programs annually. Continue popular and established interpretive programs and special events, such as the Families Understanding Nature program and National Wildlife Refuge Week. Ensure interpretive programming remains current and dynamic by continually creating new programs, incorporating new ideas, updating information, and revitalizing ongoing programs. Focus each interpretive program on one or more Refuge themes.
4. Over the life of the plan and in cooperation with Friends of Crab Orchard National Wildlife Refuge and other partners, revise Ref-

uge interpretive brochures, handouts, and other written materials as needed to improve consistency and to meet Service standards.

5. Within 1 year of the plan's approval, create a custom audiovisual program that provides visitors with orientation information about the Refuge. Ensure this program and a variety of other wildlife-related audiovisual programs are made available for viewing at the Visitor Center and for use in interpretive programs.
6. Within 3 years of the plan's approval, establish and maintain an interpretive auto tour route, using existing roads, that will facilitate opportunities for wildlife and cultural resource observation and provide visitors with an overview of the Refuge, its resources, and its management. Include identified stations with interpretive panels and corresponding, radio-broadcasted interpretive messages.

#### **Objective 5**

Increase the effectiveness of the Refuge environmental education program so that 75 percent of participants gain a better understanding and appreciation of the resources, purposes, and value of the Refuge and the Refuge System. Heighten awareness of conservation and stewardship concepts and encourage participants to take positive actions on the Refuge and in their community that support Refuge goals and the Refuge System mission.

#### *Strategies*

1. Within 2 years of the plan's approval, develop the environmental education portion of the Visitor Services Plan, outlining a comprehensive, curriculum-based approach structured to be compatible with state learning standards and national environmental education guidelines. Emphasize key Refuge resources, the Refuge, the National Wildlife Refuge System, and selected Refuge themes. These themes will be based on importance to Refuge and System goals and relevance to surrounding communities. All environmental education materials, facilities, and programs will focus on one or more of these Refuge themes, along with the basic concepts of the Refuge and the Refuge System. Refuge themes may be in a storyline form that includes three or more themes. Themes may include: Exploring the

Diversity of Wildlife, Understanding the Past, Protecting the Balance, and Communicating Visitor Opportunities.

2. Within 3 years of the plan's approval and in cooperation with Friends of Crab Orchard National Wildlife Refuge and other partners, create an array of environmental education kits, each focusing on one or more aspects of Refuge themes. Educational kits will include interactive materials and a detailed instructional and activity guide designed with a clear, consistent format and coordinated with state learning standards. Develop and maintain a multi-faceted environmental education resource library, available for use by educators and in Refuge educational programs, comprised of books, videos, posters, audio tapes, written materials, and environmental education kits.
3. Within 4 years of the plan's approval and in cooperation with other partners, establish an environmental education complex that incorporates an outdoor amphitheater with educational displays, a set of associated trails, the Refuge Visitor Center, and an educator's trail specifically designed to facilitate environmental education activities and function as an outdoor classroom.
4. Within 4 years of the plan's approval and in cooperation with other partners, create an Educator's Guide to Crab Orchard National Wildlife Refuge that provides an orientation, guidelines, grade-level and state learning standards information, maps, and site-specific activities that focus on one or more Refuge themes. Incorporate input from area educators to ensure the Refuge guide meets area teachers' needs.
5. In cooperation with other partners, conduct or host annual teacher workshops that encourage area educators to incorporate environmental education into their curriculum and to utilize Refuge materials, staff, and resources, both in the classroom and during field trips.
6. Continue currently-offered environmental education programs done by request, including on-site and off-site programs, special educational events, group camp programs, and special interest group programs. Over the life of the plan, expand the environmental education program to include additional on-

site and off-site programs, special educational events, group camp programs, and special interest group programs. Develop pre- and post-visit activities in addition to on-site activities.

7. Over the life of the plan, establish partnerships with selected local schools, agencies, and nonprofit organizations to more effectively develop and expand environmental education programs. Involve volunteers in educational programs and explore the potential for environmental education interns through Southern Illinois University and John A. Logan College. Explore the potential for creating a grant program to help area schools with field trip expenses.
8. Conduct an annual review of the Refuge environmental education program. Invite feedback from area educators. Revise as necessary.

### Customer Service Goal

*Visitors of all abilities will feel welcome and enjoy a safe visit to an area that they recognize as a national wildlife refuge.*

*Background:* Policy and guidance of the Service directs each refuge to meet basic standards in hosting visitors. The guidance covers signs, kiosks, leaflets, facility and road maintenance, customer service, and opportunities for visitor feedback. Awareness of Crab Orchard NWR as a national wildlife refuge can also influence visitor experience and enjoyment.

#### Objective 1

Improve Refuge signs, kiosks, and facilities so that 90 percent of visitors feel welcome and secure, enjoy their visit, and recognize the area as a national wildlife refuge.

#### Strategies

1. Within 3 years of the plan's approval, revise information on existing kiosks, trailhead and other identification markers, boundary signs, and other such signs as necessary to meet Service standards.
2. Within 5 years of the plan's approval, create and install additional kiosks where needed at Refuge access points to ensure that all visitors are greeted and informed that they are entering a national wildlife refuge. Ensure that all structures comply with Service standards.



*U.S. Fish & Wildlife Service*

3. Verify annually that visitors are welcomed and treated courteously by staff and volunteers. Confirm customer service standards during employee and volunteer orientations. Provide visitors with opportunities for feedback through suggestion cards, verbal reports, written mail, and e-mail through the Refuge web page. Address customer service issues promptly and professionally according to Service standards.
4. Within 2 years of the plan's approval, develop a Refuge brochure with detailed information on accessible facilities, trails, programs, and recreational opportunities at the Refuge.
5. Conduct semi-annual safety inspections of all Refuge facilities and reaffirm compliance with Service standards.
6. Maintain recognizable, consistent signs that clearly identify public hunting areas. Increase awareness among non-hunting visitors of hunting areas and seasons through effective signs and brochures.
7. Respond to notification of safety problems and unsafe situations promptly and in accordance with Service standards. Increase visibility of Refuge law enforcement, particularly during periods of heavy visitation.

### **Volunteers and Support Groups Goal**

*Volunteers and Refuge support groups will be stewardship partners and strong advocates for the Refuge.*

*Background:* Volunteers, support groups, and other partnerships strengthen Refuge activities and contribute to making the Refuge an integral part of the community.

#### **Objective 1**

Improve Refuge support for volunteer and Friends of Crab Orchard NWR activities to a point where at least 95 percent of volunteers and Friends members feel like valued contributors to the success of Refuge programs and endeavors.

#### *Strategies*

1. Continue to manage volunteer and support programs in accordance with Service guidelines detailed in “A Guidebook for Working with Volunteers.” Maintain an active liaison with support groups and partners.
2. Provide in-depth initial training to Refuge volunteers that will enable them to effectively and efficiently complete projects and responsibilities. Encourage involvement in diverse volunteer activities that match volunteer interests.
3. Continue demonstrating Refuge appreciation for volunteer contributions and Friends support annually through a Volunteer Appreciation Banquet and other appropriate means. Present awards for service hours in accordance with Service guidelines.

### **Other Land- and Water-based Recreation Goal**

*Visitors will enjoy high quality, land- and water-based activities that fulfill the recreation purpose of the Refuge when the Refuge was established.*

*Background:* There is a recognized need to improve the facilities at the Refuge. Under current trends of resource allocation, the current facilities can not be maintained at acceptable standards. The intent will be to reduce the facilities so that the quality could be improved.

A conflict has existed between anglers and high speed watercraft. A 150-foot no-wake zone along the shoreline of Crab Orchard Lake will reduce this conflict, as will additional no-wake zones in several necks on the lake and east of Highway 148.

The Haven and the Crab Orchard Boat & Yacht Club are available only to a limited segment of the general population. The facilities and activities at

these clubs amount to private use of public land. Our long-term goal is to make these areas available to a broader portion of the public.

The Haven is a 10-acre site located on the north side of Crab Orchard Lake, near the Highway 13 and Cambria Neck Road intersection. This site has been leased to the Egyptian Past Commanders Club of the American Legion since 1948 for the benefit and enjoyment of disabled veterans primarily from the Marion Veterans Hospital and the Anna State Hospital. The Haven includes a one-story lodge building, and several outside picnic sites, that are used for day visits by veterans for recreation and socializing. During the length of the planning period established for this Refuge CCP (next 15 years), the Refuge Staff will work collaboratively with the Egyptian Past Commanders Club to evaluate the effectiveness of this facility in achieving the purpose of Haven’s establishment, and to make recommendations for its future use.

We will extend the lease of the Crab Orchard Boat & Yacht Club for 2 years after the approval of the Refuge CCP. After the lease expires, we will convert the operation of the club facilities to a concession contract. This will end what amounts to private use of public land and make the facilities available to a wider portion of the public.

#### **Objective 1**

Improve the quality of boat launches, marinas, beaches, picnic areas, and campground to industry standards within the life of the CCP.

#### *Strategies*

1. Maintain picnicking at the Refuge recreational areas of Greenbriar, Wolf Creek, and Harmony Trail, and relocate picnic facilities from Cambria Neck and Playport Marina to a day use area at the current Images Marina site. Explore the option of concession-operated picnic shelters at Little Grassy and Crab Orchard campgrounds.
2. Explore the potential for a bicycle route within the restricted use area of the Refuge. The route will run mainly along old railroad beds.
3. Continue current policies on swimming at Devils Kitchen, Little Grassy and Crab Orchard lakes. Prohibit scuba diving.

4. Within 10 years of the plan's approval, upgrade boat ramps and associated parking at Devils Kitchen, Little Grassy and Crab Orchard lakes.
5. Continue current zoning on Crab Orchard Lake with additional no wake zones (see Figure 28). Gas motors will be prohibited in the most southeastern arm of Devils Kitchen Lake, from the mouth of Grassy Creek south to the Refuge boundary, and in ponds within the public use area. The portion of the lake south of Line Road 6 boat ramp will be designated a no-wake zone (see Figure 29).
6. Horseback use on the Refuge will be confined to a designated River to River Trail (see Figure 30 on page 86) and erosion due to trail use will be actively controlled through maintenance and/or seasonal closures.
7. Camping at Devils Kitchen will be reduced to primitive sites only. Crab Orchard and Little Grassy campgrounds will be upgraded to standards comparable to others in the area.
8. Within 2 years of the plan's approval, consolidate Playport and Images marinas on Crab Orchard Lake. Images marina slips will be moved to Playport marina. Within 5 years of the plan's approval, remove the building at Images Marina and develop the area into a large access area to the lake with a comfort station.
9. After 2 years of the completion of the CCP, the Crab Orchard Boat & Yacht Club will be converted to a concession.

## Agricultural Goal

*Provide opportunities for agricultural uses on Refuge lands that help attain wildlife conservation goals.*

*Background:* Agriculture, one of the specified purposes of the Refuge, has been a part of the landscape since early settlement. After many years of soil depletion and erosion, beginning in the 1930s efforts have been made to implement better farming practices. On the Refuge, agriculture has been used to benefit wildlife, chiefly wintering Canada Geese.

### Objective 1

Continue farming operations on about 4,400 acres of row crops with greater emphasis on conservation practices.

### Strategy

1. Maintain infrastructure (roads, fences) in support of agricultural operations. Drop small, less profitable fields (less than 5 acres) from row cropping and convert to other cover (about 15 fields totaling 52 acres). Identify and drop farmed wetlands from the farm program. Permit cooperator to harvest corn remaining in the field in the spring. Emphasize Johnsongrass control. Prohibit mowing of clover in the crop rotation until after August 1. Enlist technical oversight from Natural Resource Conservation Service and University of Illinois Extension.

### Objective 2

Continue farming operations on about 700 acres of hay fields with greater emphasis on conservation practices.

### Strategy

1. Prohibit mowing of hay until after August 1. Maintain an updated rate charge for hay.

### Objective 3

Enhance nesting habitat for grassland birds while maintaining or increasing the value for grazing on about 1,000 acres of pastures.

### Strategy

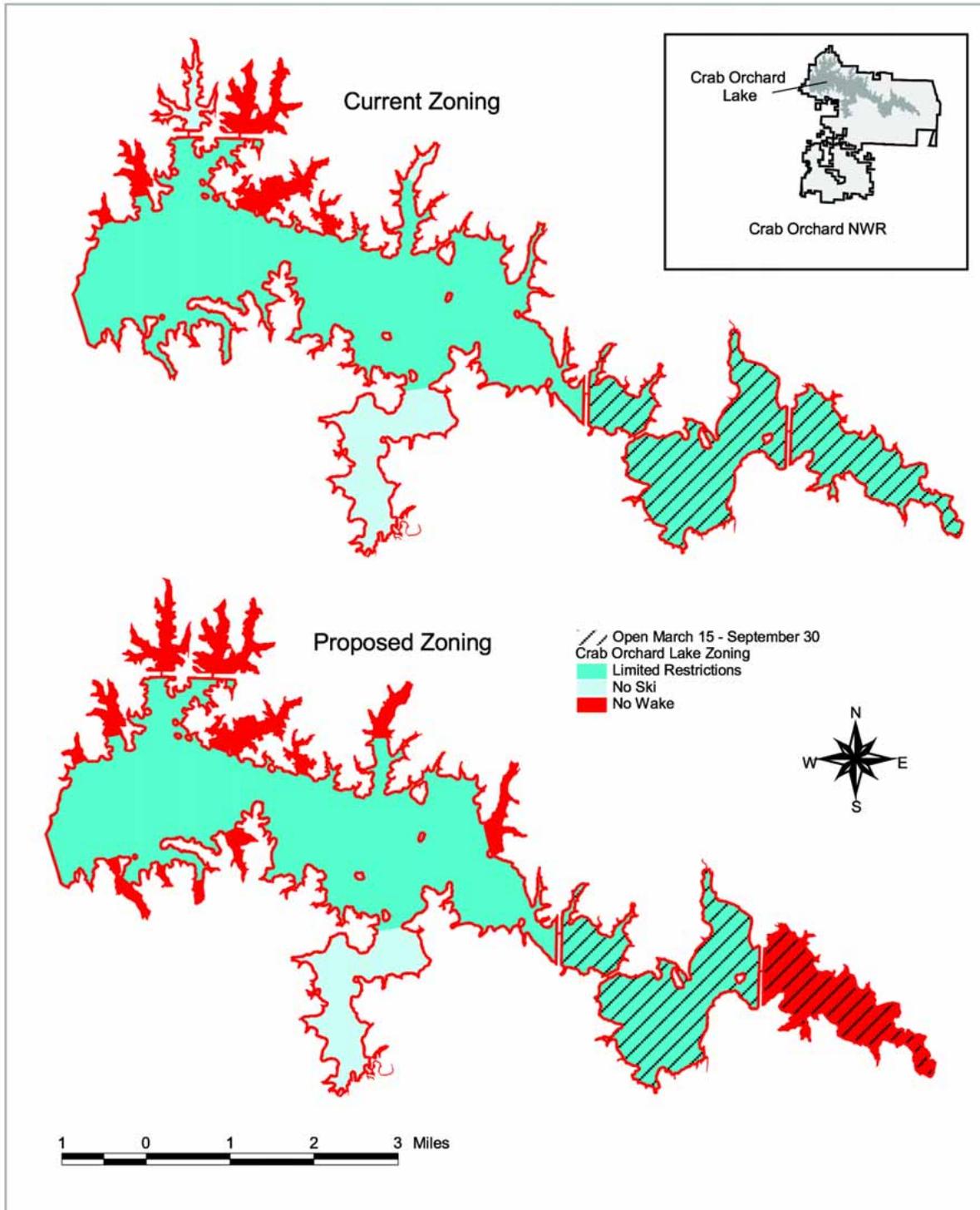
1. Convert fescue pastures to other cool-season grasses and native warm season grasses with higher wildlife value. Divide existing pastures into three or four paddocks with a paddock of cool season grass and two or three paddocks of native warm season grasses. Rotate grazing cattle among the paddocks during the season. Enlist technical oversight from Natural Resource Conservation Service and University of Illinois Extension.

## Industrial Goal

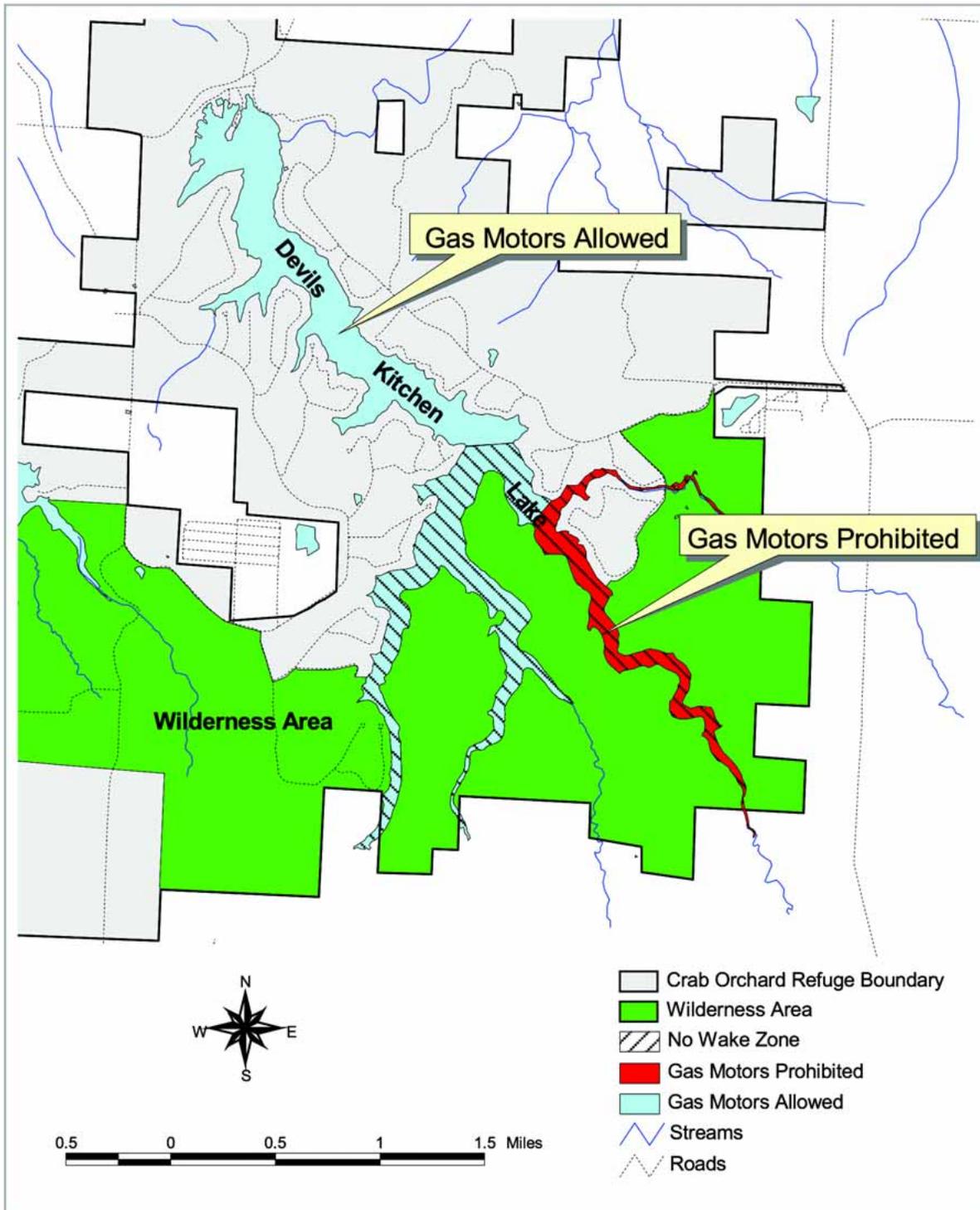
*Provide an industrial complex and attendant utility and transportation infrastructure, which conform to prescribed safety, health, environmental and maintenance standards.*

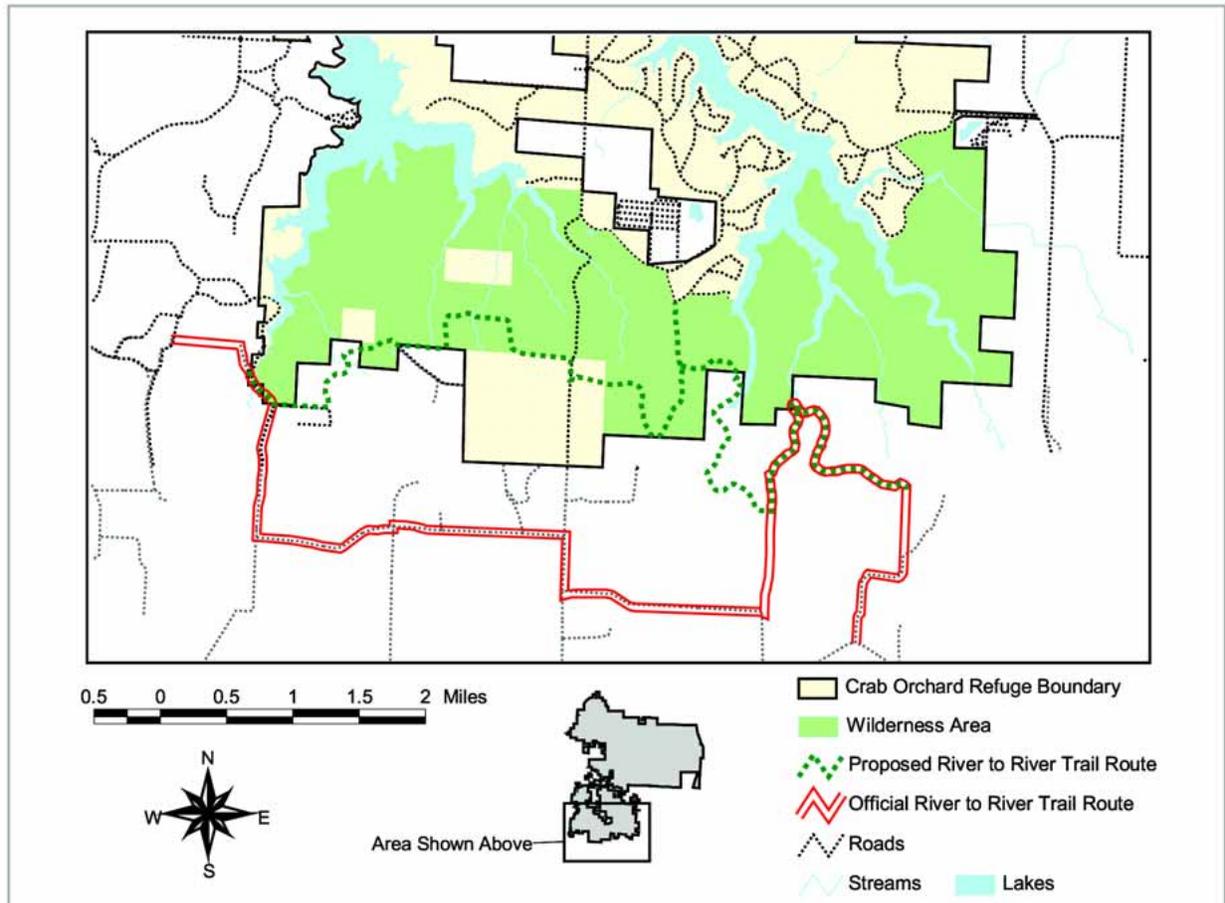
*Background:* Industry began in the area during World War II. When the Refuge was established it was given an industrial purpose, because industry was seen as a way of improving the economy of the area. The war time industry and some subsequent industrial tenants have contaminated the soils and waters of the Refuge. Providing the water and sewer infrastructure in support of industry has been

**Figure 28: Crab Orchard Lake Watercraft Zoning**



**Figure 29: Devils Kitchen Lake Zoning, Crab Orchard NWR**



**Figure 30: Horseback Riding Trails on Crab Orchard NWR**

difficult for the Refuge to accomplish. Most of the manufacturing and storage buildings are reaching the limits of their expected lifetime. The buildings require a lot of maintenance and refurbishing to meet today's standards. Recently, several industrial parks have been developed in the area that offer amenities not available on the Refuge. Of the industries on the Refuge, the munitions industry is in a unique position of requiring widely spaced facilities for safety. By providing a safe area for munitions manufacture, the Refuge is able to contribute to and support the national defense. The Refuge will continue to provide an area for defense munitions manufacture. The Service will seek not to compete with neighboring industrial parks. The Refuge will maintain roads and provide water and sewer services sufficient for current industrial tenants. Tenants will be expected to bring their facilities up to prescribed safety, health, environmental and maintenance standards under any new leases. If tenants do

not renew leases, the Refuge will seek new tenants for facilities that continue to be suitable for occupancy. The intent will be to consolidate the areas occupied by industry.

#### **Objective 1**

Consolidate the areas occupied by industry.

#### *Strategies*

1. Update Industrial Policy. Maintain the current infrastructure to support existing facilities.
2. Remove buildings that are no longer suitable for occupancy for reasons of contamination, safety or lack of structural integrity and restore to natural habitats.



U.S. Fish & Wildlife Service

## Wilderness Goal

*Protect the ecological integrity, preserve the wilderness character, restore natural conditions to the extent practicable, and provide opportunities for solitude and primitive recreation within the Crab Orchard Wilderness.*

*Background:* As long as they do not alter natural processes, the Wilderness Act of 1964 permits certain activities within designated wilderness areas. The Crab Orchard Wilderness is a popular area for hunting, hiking, nature study, horseback riding, and mushroom picking. Prohibited activities, such as camping and off-road vehicle use, occasionally occur. Horseback use and trails have developed inconsistent with the existing Wilderness Management Plan. The Wilderness Management Plan, which was approved in 1985, is dated and needs to be revised.

### *Suitability*

The CCP planning included a wilderness review to identify Service-owned lands and waters within the planning unit that may qualify for inclusion in the National Wilderness Preservation System. The Service identified two tracts of land within the planning unit that meet the criteria for Wilderness Study Areas: an 80-acre tract completely sur-

rounded by the existing Crab Orchard Wilderness and a 40-acre tract surrounded on three sides by the Crab Orchard Wilderness. Southern Illinois University owned both tracts when the Crab Orchard Wilderness was designated in 1976. The Refuge subsequently acquired the tracts through a land exchange in 1979. The two tracts are roadless, contiguous to designated wilderness, appear natural, and offer opportunities for solitude and primitive recreation. Both tracts are currently managed as a part of the Crab Orchard Wilderness.

The two parcels should be recommended for wilderness designation. This will add consistency to the protection and management of the Wilderness. The Wilderness will be managed in accordance with Service policy for Wilderness management (6 Refuge Manual 8). All activities in designated Wilderness will be carried out in conformance with the mandates of the Wilderness Act and the establishing legislation for the Crab Orchard Wilderness, Public Law 95-557. The use of motorized vehicles and mechanical transport is prohibited, except in emergency situations.

### **Objective 1**

Recommend the designation of two parcels (120 acres) as Wilderness within 2 years of approval of the CCP.

#### *Strategy*

1. Prepare and submit a Wilderness Study Report. Service wilderness policy is currently under revision. The direction of the new policy will be followed when it is adopted.

### **Objective 2**

Revise and implement the Crab Orchard Wilderness Management Plan within 5 years of approval of the CCP.

#### *Strategy*

1. Prepare and implement a Wilderness Management Plan. Service wilderness policy is currently under revision. The direction of the new policy will be followed when it is adopted.

### **Objective 3**

Restore native hardwood forest on 325 acres of pine and pine-hardwood forest in the Crab Orchard Wilderness within 15 years of approval of the CCP.

*Strategies*

1. Thin the pine plantations (229 acres) and pine-hardwood stands (96 acres) in the Wilderness to promote establishment and growth of native hardwoods. Thinning will be conducted in several phases over a 10- to 15-year period to mimic the natural process of succession where pines are gradually replaced by hardwoods. Individual pines will be killed by cutting, girdling or injecting herbicide. No trees will be removed from the site. Treatments will be conducted so that the results will appear natural as much as possible. However, trees along heavily used trails may need to be felled to avoid personal injury to visitors, in which case this zone may appear unnatural for several years. Eventual removal of all the non-native pines will restore the natural vegetative cover of the area and enhance wilderness characteristics.
2. Prescribed burn the pine and pine-hardwood stands during the dormant season (November through March) on a 3- to 5-year cycle to enhance habitat conditions and promote desirable hardwood regeneration. Control lines will be established by hand tools where necessary, using natural firebreaks as much as possible.

**Objective 4**

Control or eradicate invasive species (especially autumn-olive, multiflora rose, Amur honeysuckle, white poplar, and Oriental bittersweet) over the 15-year life of the CCP.



*U.S. Fish & Wildlife Service*

*Strategy*

1. Prepare and implement an Integrated Pest Management Plan following guidance developed by the Service's "Promises Invasive Species Team."

**Objective 5**

Explore ways to increase cooperation with the U.S. Forest Service on management of the Crab Orchard Wilderness and the adjoining Panther Den Wilderness within 2 years of approval of the CCP.

*Strategy*

1. Contact the Forest Supervisor of the Shawnee National Forest and discuss ways our agencies could work together in managing the adjoining wildernesses.

**Objective 6**

Provide opportunities for primitive recreation, such as hiking, hunting, nature study and wild food collection, over the 15-year life of the CCP.

*Strategies*

1. Continue current primitive recreational opportunities.
2. Prepare and distribute a wilderness brochure and conduct interpretive programs to inform the public about primitive recreational opportunities available.

**Objective 7**

Within 5 years of approval of the CCP, determine an appropriate level of opportunities to offer equestrians based on an evaluation of the current level and extent of horseback riding use and its effects on the Wilderness.

*Strategy*

1. Evaluate the current, unauthorized River to River route. Cooperate with partners to plan, construct, and maintain an authorized River to River trail route through the Refuge.

**Protection Goal**

*Protect the integrity of Refuge biological and cultural resources and the health and safety of visitors, industrial workers, farmers, and Service staff.*

*Background:* Past industrial practices at the Refuge contaminated some lands and waters. As a result, in 1987 the Refuge was added to the U.S. Environmental Protection Agency's National Priorities List of contaminated sites. Studies have located

many sites of contamination within the former Illinois Ordnance Plant (IOP) resulting from military activities that occurred during World War II or subsequent activities of private industrial tenants. Lands no longer used by industry are converted to habitat for fish and wildlife. Some of these lands have been contaminated. These contaminants may need to be removed so that they do not adversely impact plants, fish, wildlife, or public health and welfare. Refuge visitors should be able to use these habitats for hunting, fishing, wildlife observation and other potential future uses without being exposed to unacceptable levels of contaminants. The Service is seeking remedy for past acts of contamination through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as “Superfund.” The Service believes past acts of contamination should be remedied with the best and most cost effective technologies available. The Service also believes that the Refuge should not be burdened with residual contamination that may impair the ability of the Service to manage the Refuge for appropriate uses in the future.

The Refuge's law enforcement officers serve to protect the natural and cultural resources, as well as the health and safety of visitors, staff, and tenants. The Refuge depends on cooperative relationships with the Illinois DNR and several local sheriff departments.

The Refuge faces a significant challenge of controlling exotic and invasive plants to protect biological diversity, provide high quality habitats for fish and wildlife, and facilitate agriculture, recreation, and industry.

The Refuge contains many documented cultural resources, and other undiscovered sites probably exist.

The Refuge manages 24 conservation easements within a 21-county area in southern Illinois. Inadequate staffing levels have impeded proper management of the widely dispersed easements. Some of the easements have not been surveyed or marked on the ground. The easements should be inspected regularly, but there have been long periods between inspections. Without appropriate monitoring the easements and their resources can not be protected from encroachment.

#### **Objective 1**

Refuge lands and waters are safe for fish, wildlife, plants, and people.

#### *Strategy*

1. Work with USEPA, Illinois EPA, Departments of Interior and Justice, and responsible parties to remediate contaminated sites. Where contamination is left in place, or where there is potential for undiscovered contamination that may pose a risk from exposure, institutional controls may be formulated. An institutional control plan will be written by the CERCLA staff and made available to Refuge management for implementation.

#### **Objective 2**

Visitors will feel safe on the Refuge and illegal harvest of fish and wildlife will be reduced.

#### *Strategy*

1. Maintain full-time law enforcement staff.

#### **Objective 3**

Manage or eliminate invasive species on the Refuge.

#### *Strategy*

1. Write and implement an Integrated Pest Management (IPM) Plan following guidance developed by the Service's “Promises Invasive Species Team.” The IPM plan will address target species control methods, mapping and monitoring.

#### **Objective 4**

Protect the cultural, historic, and pre-historic resources of federally-owned lands within the Refuge.

#### *Strategies*

1. Implement the Cultural Resource Management Plan for Cultural Resources within the Crab Orchard National Wildlife Refuge (Godfrey and Stubbs 2001).
2. Ensure archeological and cultural values are described, identified, and taken into consideration prior to implementing undertakings. Notify the Regional Historic Preservation Officer early in project planning or upon receipt of a request for permitted activities.
3. Develop a step-down plan for surveying lands to identify archeological resources and for developing a preservation program.

4. Complete accessioning, cataloging, inventorying, and preserving the museum collection at the Refuge in accordance with “Survey of Collections at Crab Orchard NWR” by Mayda S. Jensen.

#### Objective 5

Meet Service policy guidelines (“Administration and Enforcement Procedures for Conservation Easement”) for 12 conservation easements by 2007, for all easements by 2010.

1. Complete legal surveys on 50 percent (12 tracts) of all conservation easements by 2007 through contracted services. Complete contracted surveys on the remaining tracts by 2010.
2. Conduct annual inspections of all conservation easements.
3. Develop land use plans for 50 percent (12 tracts) of the conservation easements and restore grassland and wetland habitats on 25 percent of these tracts by 2009.
4. Hire a permanent 6-month law enforcement officer to conduct annual inspections, develop land use plans, and restore wetland and grassland habitat projects.

### Outreach Goal

*Visitors, cooperators, tenants, and local residents will understand Refuge goals, issues and activities. Service personnel will understand the expectations and concerns of the general public by being receptive to their feedback.*

*Background:* During the scoping process, residents of local communities reported they felt uninformed by the Refuge about activities occurring on the Refuge and about the reasons for certain activities. To resolve this concern, the Refuge will communicate more effectively with local communities and listen more attentively to community concerns.

In keeping with the history of public use on the Refuge, many non-wildlife oriented special events have been permitted on the Refuge. These special events have included organized running, bicycling, and swimming events, use of Refuge for “National Hunting and Fishing Days” activities, and American Red Cross Blood Drives.

The Refuge will continue to support special events that foster good community relations and are organized by nonprofit organizations. To be permitted, these events cannot damage Refuge habitats or



Glenn Smart

facilities, nor can they adversely impact fish and wildlife populations. In addition these events cannot interfere with Refuge visitors and wildlife-dependent activities such as hunting, fishing, and environmental education. Permitted activities will be limited to one-time and annual events.

#### Objective 1

The positive attitude toward Refuge management will increase among visitors, cooperators, tenants, and local residents throughout the life of the plan.

#### Strategies

1. Issue press releases, hold Refuge open houses and hold regularly scheduled forums.
2. Within 2 years of the Plan's approval, create and maintain a “listening log” of written and verbal public input submitted to the Refuge. Review this log quarterly and address voiced community concerns.
3. Provide annual reports on the “State of the Refuge.” Distribute these reports upon request at the Visitor Center and by mail and post the current year's report on the Refuge website.
4. Continue to permit selected annual and special events that are organized by nonprofit organizations, provided they are compatible and do not damage Refuge resources or interfere with wildlife-dependent recreation.