

**DRAFT COMPREHENSIVE CONSERVATION PLAN REVISION
AND ENVIRONMENTAL ASSESSMENT FOR**

**WAPANOCCA
NATIONAL WILDLIFE REFUGE**

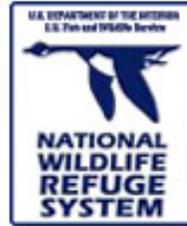
Partial Revision of the Wapanocca National Wildlife Refuge Section of the
Central Arkansas National Wildlife Refuge Complex Comprehensive Conservation Plan
and Accompanying Draft Environmental Assessment

Southeast Region



Wapanocca National Wildlife Refuge

DRAFT COMPREHENSIVE CONSERVATION PLAN REVISION
AND ENVIRONMENTAL ASSESSMENT
OF THE
**WAPANOCCA NATIONAL WILDLIFE REFUGE SECTION OF THE
CENTRAL ARKANSAS NATIONAL WILDLIFE REFUGE COMPLEX
COMPREHENSIVE CONSERVATION PLAN**



**U.S. Department of the Interior
Fish and Wildlife Service**
Southeast Region

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SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN REVISION

I. Background

INTRODUCTION

The U.S. Fish and Wildlife Service (Service), Southeast Region, proposes to partially revise the Wapanocca National Wildlife Refuge (NWR) Comprehensive Conservation Plan (CCP) by phasing out upland cropland farming for migrant Canada geese. This revision modifies Objective 1-1 under Goal 1 and Objective 2-3 under Goal 2 (Pages 190-193 and 203-205 in USFWS 2009a). The CCP for Wapanocca NWR was included in the Central Arkansas National Wildlife Refuge Complex CCP for Bald Knob, Big Lake, Cache River and Wapanocca National Wildlife Refuges (USFWS 2009a) (Figure 1).

BACKGROUND

The purpose and vision of the Refuge are outlined below, along with an overview of why the Service is considering revising some of the CCP objectives and strategies of the original plan.

REFUGE PURPOSE

Wapanocca NWR's official purpose is:

"...for use as an inviolate sanctuary, or for any other management purposes, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act).

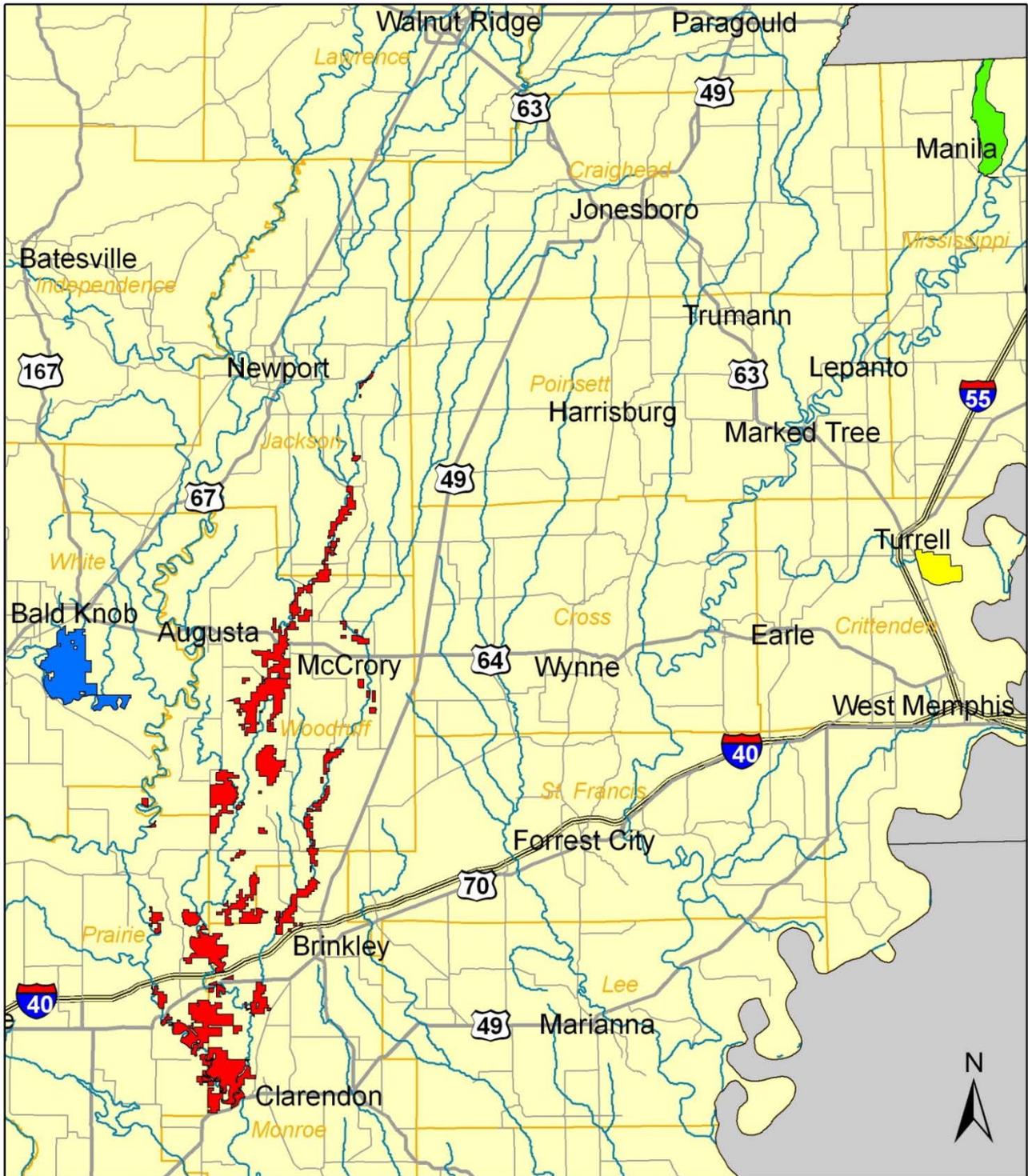
REFUGE VISION

"Refuges within the Central Arkansas NWR Complex will be conserved and managed as havens for migratory birds, especially waterfowl, in a region of the continent critically important for their survival. Working with partners, the Service will protect, restore, and enhance bottomland hardwood forest ecosystems, wintering waterfowl habitats, and other fish and wildlife habitats for the benefit of the American public. The Service will provide opportunities for the public to use and enjoy these refuges in a way that safeguards their values and promotes awareness of their importance (USFWS 2009a)."

RATIONALE FOR PROPOSED REVISION

Wapanocca NWR was a significant wintering area for the Mississippi Valley Population (MVP) and the Eastern Prairie Population (EPP) of Canada geese in the 1970's and 1980's. The Refuge accommodated these geese by seasonally closing sanctuary areas to prevent disturbance from humans and by providing unharvested corn and winter wheat for high energy forage. By the late 1980's, the majority of MVP and EPP birds had ceased migrating to Arkansas due to the abundance of secure roosting areas and cropland waste corn in Missouri, Illinois, and Wisconsin. Low numbers of MVP and EPP geese continued to winter in Arkansas, however the statewide Canada geese midwinter survey estimate five year averages never exceeded 1% total population estimate. Due to its intensively managed habitat, Wapanocca hosted many of Arkansas' last wintering MVP and EPP geese through the early 2000s. In 2007, the Lower Mississippi Valley Joint Venture (LMVJV)

Figure 1. Central Arkansas NWR Complex



Cache River NWR Bald Knob NWR Big Lake NWR Wapanocca NWR

0 20 40 80 Miles

eliminated all goose-specific habitat objectives for the Mississippi Alluvial Valley (MAV), recognizing that significant numbers of MVP and EPP geese no longer winter in the region.

Large numbers of lesser snow geese began wintering in Northeast Arkansas in the 1990s. In addition to feeding in off-refuge agricultural lands, these birds readily consume Wapanocca NWRs unharvested crops grown for Canada geese. Snow geese are now the primary bird feeding in the Refuge's unharvested corn and winter wheat. The *USFWS' 2007 Final Environmental Impact Statement: Light Goose Management* encourages refuges to decrease the availability of snow goose forage whenever possible (USFWS 2007).

Based on these significant developments, Wapanocca NWR proposes to change its management plans for the current upland farmed area to more effectively fulfill its migratory bird purpose.

II. Refuge Overview

For a complete description of the affected environment in addition to what is provided below, see Section A, Chapter II, Refuge Overview of the Central Arkansas NWR Complex CCP (USFWS 2009a) which is incorporated herein by reference. Updated and new information is incorporated in Chapter II of the Environmental Assessment (Section B).

III. Plan Development

For a complete description of the Plan Development in addition to what is provided in Chapter I, Introduction, of this document, see Section A, Chapter III, Plan Development of the Central Arkansas NWR Complex CCP (USFWS 2009a) which is incorporated herein by reference.

IV. Management Direction

For a complete list of Wapanocca NWR goals, objectives and strategies in addition to what is provided and revised below, see Section A, Chapter IV, Management Direction of the Central Arkansas NWR Complex CCP (USFWS 2009a) which is incorporated herein by reference. Only the goals, objectives, discussions and strategies that the Service is proposing to revise are provided below.

ORIGINAL CCP GOALS AND OBJECTIVES

Under Goal 1 of the original CCP for the Wapanocca NWR: ***Manage and protect migratory birds and native wildlife populations on Wapanocca NWR to fulfill the purpose for which it was established and to contribute to the mission of the Refuge System***, Objective 1-1 is revised. The original description of the objective is as follows:

Wapanocca NWR Objective 1-1: Migratory Waterfowl

Within 5 years of the date of this CCP, increase DEDs from the current level of 613,193 to 1,370,000 DEDs of managed waterfowl habitat that includes moist-soil, bottomland forest, un-harvested cropland, and forested swamp habitats, flooded to a depth of two feet or less, in sanctuaries (November 1 – February 28) sufficient to meet the habitat and population goals of NAWMP as stepped-down through the LMVJV.

Discussion: Concern over waterfowl population declines in the 1980s resulted in establishment of the NAWMP, which focused the attention of federal, state, and private conservation groups on critical wintering and breeding areas. The LMVJV, which encompasses all four refuges in the Complex, was selected as one of the wintering habitat focus areas. One of the first tasks faced by the LMVJV was to develop a model or decision tool for determining how much habitat was needed, and a method for relating this objective to the population goals of the NAWMP. The solution was to consider wintering areas as responsible for contributing to the spring breeding population goals of NAWMP proportional to the percentage of ducks historically counted in wintering areas (Loesch et al. 1994; Reinecke and Loesch 1996). In order to contribute ducks to spring breeding populations, wintering areas must provide sufficient habitat to ensure adequate winter survival. To quantify winter habitat requirements, the LMVJV had to identify limiting factors and made an assumption that foraging habitat was the most likely factor to limit waterfowl populations in the LMV (Reinecke et al. 1989). The process of relating habitat objectives for individual management areas to overall habitat objectives for the LMV involved several steps (Biological Review for Bald Knob and Cache River NWRs, USFWS 2008). Step-down objectives were established for Wapanocca NWR (Table 1). DED objectives were calculated by multiplying the acreage objective by the assumed DED standard developed by the LMVJV for that habitat type.

Table 1. Wapanocca NWR - Current migrating and wintering waterfowl foraging habitat objectives established by the LMVJV (Original Table 12 from Central AR NWR Complex CCP (USFWS 2009a)).

| Habitat | Objective ¹ Acres (DED) ³ | Current Capability ² Acres (DED) ⁴ | Difference (+ or -) Acres (DED) |
|--------------------------|--|---|------------------------------------|
| Moist-soil | 138 (257,784) | 200 (373,600) | +62 (+115,816) |
| Bottomland Forest | 317 (39,942) | 41 (2,809) | -276 (-37,133) |
| Unharvested Crop | 85 (1,072,870) | 68 (223,470) | -17 (-849,400) |
| Harvested Crop | 0 (0) | 0 (0) | 0 (0) |
| Forested Swamp | 0 (0) | 2,354 (13,314) | +2,354 (+13,314) |
| Total | 540 (1,370,596) | 2,663 (613,193) | +2,123 (-757,403) |

¹Acreage and DED objective provided by the LMVJV office 2003.

²Current acreage and DED capability (has levees and water control structure, some have pumping capability) provided by refuge staff.

³DED estimates, calculated by using standard DED figures provided by LMVJV.

⁴Updated DED estimates adopted by the LMVJV Waterfowl Working Group in June 2006: moist-soil, 1,868 DEDs/ac; bottomland hardwood, 191 DEDs/ac; unharvested crop, 14,061 DEDs/ac (estimate based on actual acres of various grain crops left unharvested and flooded during the winter period); harvested crop, 287 DEDs/ac (estimate based on actual acres of various harvested grain crops flooded during the winter period).

This refuge has opportunities to provide most components of waterfowl foraging habitat (e.g., grains, browse, moist-soil, wooded swamp/bottomland forest, aquatic plants) in conjunction with necessary sanctuary. Much of the refuge's original open lands (croplands) have been planted back to hardwood forest; however, the refuge still provides some habitat for Canada Geese, White-fronted Geese, and Snow/Blue Geese. Although use by Canada Geese has declined, it is important that the refuge maintain its capability to harbor geese – a species group with high site fidelity. Current NAWMP plans for geese in the Mississippi Flyway include the objective of providing geese with suitable habitat on traditional southern wintering grounds; thus, there is a need for some open lands and agricultural crops. In order to best achieve refuge purposes given the current and expected waterfowl use patterns at Wapanocca NWR, it is necessary to re-evaluate the current cooperative farming program and implement modifications that would better enable the refuge to fulfill its purpose. Priorities for habitat management need to be adjusted to provide better habitat for other migratory birds that will use the refuge more intensively than Canada Geese. These adjustments will result in reductions in annually farmed acreages and increases in grassland/scrub-shrub habitat management adjustments in types/acreages/locations of crops grown, and intensification and expansion of moist-soil management programs. See Wapanocca NWR Objective 2-3 for specific details in modifying this program. All other farming/moist-soil strategies discussed under Objective 1-1 eventually will be dependent on the outcome of this assessment.

The refuge has 32 moist-soil units, totaling about 288 acres. Unless intensively managed, the suitability of such units to provide needs of wintering waterfowl will decline. Greater flexibility is needed to intensify moist-soil management to include rotating units into the refuge crop-share and cultivating hot foods in these units as a means to set back woody encroachment and control pest plant invasions.

Flooded bottomland forest habitats not only provide food in the form of acorns, fleshy fruits, and invertebrates, but also provide cover, sanctuary, and nesting sites. However, the quantity of actual winter and early spring flooded forests is estimated to provide only 10-15 percent of the refuge's total desired DEDs.

The refuge's 600+ acre Wapanocca Lake is a waterfowl site of major importance. It is crucial as a sanctuary, roosting, feeding, and gathering area. The lake attracts large numbers of dabbling and diving ducks, as well as geese and other non-game waterbirds. Currently, Wapanocca Lake is believed to be the major regional sanctuary site for peaks of over 150,000 ducks and geese. Much care is needed to ensure the long-term biological integrity and environmental health of this lake system.

Another refuge management practice of critical importance is maintaining a high degree of waterfowl sanctuary (area free of disturbance) in several areas within this relatively small refuge during key waterfowl and waterbird use periods - November through February/March. Extensive movements and frequent flight induced by excessive disturbance can have immediate direct and subsequent indirect negative impacts to waterfowl. During this critical period, disturbance to waterfowl must be kept to a minimum to allow them to maintain proper body weight, conserve energy, and build fat and protein levels.

Strategies:

- Minimize human disturbance to wintering waterfowl and migrating shorebirds on Wapanocca Lake by closing the lake to all public entry and use from December 1 through February 28, and limiting other activities, such as bird observation, use of observation blinds, and aerial flyovers, to those necessary for official avian surveys.
- Assess the current and expected waterfowl use of the refuge. If goose numbers of <12,000 per year are expected, then in conjunction with AGFC and the Service's Division of Migratory Birds, determine appropriate adjustments to the cooperative farming program to best achieve refuge purpose and modify the cropland management program accordingly. Proposed modifications to current waterfowl habitat management practices (see Objectives 2-3) include:
 - Adjusting the types, acreages, and/or location of crops grown as necessary to provide forage that will be extensively used by wintering waterfowl;
 - Decreasing underutilized (by waterfowl) farmed acreages by converting such croplands to areas managed in grassland/scrub-shrub habitats;
 - Intensifying and expanding moist-soil management practices in order to best accommodate waterfowl needs;
 - If additional cropland is later required to meet DED needs, return some grassland back to the farming program for use as winter green browse.

-
- If no adjustments are made to the current cropland management program, then the following strategies would be implemented:
 - Provide for the hot food needs of a mixture of Canada, White-fronted, and Snow Geese in open fields away from forest tree lines, using cooperative farming or force account farming to plant green browse (wheat) in September in open fields (to be available by early November) in order to meet foraging objectives for wintering geese.
 - Establish and maintain up to 85 acres of unharvested grain crops (mix of milo, millet, corn) in several floodable portions of the wetland impoundments. Rotate such crops every 2 to 3 years in certain moist-soil areas to help set back succession.

Under Goal 2 of the original CCP for the Wapanocca NWR, ***Protect, restore, and manage the functions and values associated with diverse bottomland hardwood forest and open wetland systems in order to achieve refuge purposes, wildlife population objectives, and to benefit migratory waterfowl and other native wildlife***, Objective 2-3 is revised. The original description of the objective is as follows:

Wapanocca NWR Objective 2-3: Cropland Habitat Management

Continue to manage 498 acres of croplands, primarily producing soybeans, milo, and winter wheat, through a Cooperative Farming Agreement, and within 5 years of the date of this CCP, convert approximately 250 acres of under-utilized croplands to managed grasslands for migratory songbirds while also providing sufficient habitat to meet the forage objectives for wintering waterfowl of the NAWMP as stepped-down through the LMVJV.

Discussion: Wapanocca NWR was established to provide a wintering area for migratory waterfowl, a nesting and brooding area for wood ducks, and serve as a link in the chain of refuges along the Mississippi River, to encourage the southward migration of Canada Geese. Cooperative farming is a vital tool for providing a desirable balance of waterfowl habitat types in fulfillment of the refuge purpose. The high-energy cereal grain crops, left as the refuge's share of the cooperative farming program, artificially fill a void left by the loss of acorn-producing bottomland hardwood stands that once made up the majority of the habitats in the surrounding area. When these hardwood stands were cleared for farmland in the mid-1900s, a major component of the diet of wintering waterfowl was lost. The cereal grain crops planted within the refuge's farming program assist in substituting for that natural food component during the harsh winter months when a high-energy diet is critically needed.

In 1984, an objective of 1,200,000 Canada Goose Use Days was established by the LMVJV for Wapanocca NWR and management of the refuge's cooperative farming program has since worked toward accomplishing that goal. However, the full utilization of crops grown for Canada Geese has only occurred in 3 years in the history of the refuge. Wapanocca NWR has not witnessed large numbers of Canada Geese in recent years, and the 52 acres of unharvested corn and 117 acres of winter wheat that have been the established minimum requirements to meet these goals have been severely under-utilized by wintering waterfowl. In 2008, unharvested milo (65 acres) and winter wheat (17 acres) also were under-utilized by Canada Geese. It is the professional judgment of the refuge manager and biologists with the Service's Division of Migratory Birds that the refuge's cropland habitat management program should allow for more flexibility and diversification, in order to benefit a wider array of migratory bird species and other native wildlife that inhabit the refuge. In short, the cropland management program should be more adaptive to current trends in waterfowl use, while still remaining true to the overall refuge purpose.

In recent years, wintering Snow Goose populations in the Mississippi Flyway have continued to increase. Refuge staff should remain aware of these increasing trends and alter the cropland management program to either encourage or discourage use of these birds, depending on the necessary management emphasis within the flyway for waterfowl and migratory birds in general.

The soil and topography of the refuge farm units on Wapanocca NWR are somewhat diversified. The soil ranges from mild clays in the lower areas to slightly to extremely sandy loams on the upper hills. Historically, these lands provided a great diversity of plant life within a relatively small area, ranging from swampy bottoms to hardwood stands, to even grasslands on the sandy ridges. In order to maintain this biological integrity and achieve the purposes of Wapanocca NWR, it is necessary to keep in mind this historical diversity and ensure that the cooperative farming program fulfills the proper role in providing the habitats necessary to serve the needs of wintering waterfowl, migratory birds, and other native wildlife.

The majority of the refuge's 288 acres of moist-soil habitats also should be included within the refuge's share of the farming program on a rotational basis as needed in order to set back plant succession, control invasive plant species, and stimulate growth of native, moist-soil vegetation. Although these native plants do not provide the high-energy of cereal grain crops, they are nutritionally complete and vital to the overall nutritional health of wintering waterfowl.

Cooperative farming on Wapanocca NWR will continue to create the most beneficial foraging habitats on croplands currently used by wintering waterfowl and other migratory birds until such time that resources allow for comparable management operations to be performed by refuge staff through force account farming.

Strategies:

- Continue to use cooperative farming on a 75:25 crop-share basis on 498 acres of existing agricultural lands on Wapanocca NWR as a vital tool to maintain overall health and diversity of refuge habitats and provide critical foraging habitats for waterfowl, shorebirds, and other migratory birds and native wildlife.
- Due to extended trends of low populations of wintering Canada Geese on Wapanocca NWR, convert up to 263 acres of the current 761 acres of cropland to grassland habitat. These acres will include the higher elevation sandy ridges spread throughout the farm acreage that prior to European settlement, consisted of native grassland habitat. If numbers of wintering Canada Geese return to their former levels, these acres will be recycled back into the farm program for use as winter browse habitat. Implement the transition to grassland habitat over a period of 3 to 5 years, beginning in the 2010 farm year.
- Incorporate up to 160 acres of moist-soil units into the refuge's 25 percent share of the crops as necessary to assist in control of invasive vegetation, set back woody encroachment, and allow cultivation of crops in the moist-soil units to increase the supply of hot foods available to wintering waterfowl.
- Monitor vegetation responses to habitat management practices and associated waterfowl use throughout the refuge, as well as shifting trends in migratory bird use within the Mississippi Flyway, and adapt management of the cropland programs as conditions warrant to ensure that the purposes of Wapanocca NWR are achieved and the refuge can fulfill its necessary role within the context of the Mississippi Flyway.

-
- Modify existing landscape structure within all farm units by creating a mosaic of smaller crop fields, grasslands, intensively managed moist-soil units, hedgerows and buffer strips, and reforested old-field habitats to provide a diversity of habitats similar to what existed on these lands historically, while keeping refuge goals for waterfowl and other migratory birds as a top priority.
 - Maintain, if feasible, up to approximately 30 acres of sunflowers or milo as part of the refuge's 25 percent crop share to provide forage for Mourning Doves and other migratory birds and to provide increased opportunities for youth hunting.
 - Administer the cooperative farming program in compliance with 50 CFR 29.1, 5 RM 17, 6 RM 4, and 603 FW 2.

REVISED CCP OBJECTIVES & PROJECTS

The following objectives (as listed on pages 190 and 203 of the Central AR NWR Complex CCP, USFWS 2009a) would be revised as follows:

Under Goal 1 of the original CCP for the Wapanocca NWR, ***Manage and protect migratory birds and native wildlife populations on Wapanocca NWR to fulfill the purposes for which it was established and to contribute to the mission of the Refuge System***, the revised objective (Objective 1-1) is as follows:

Wapanocca NWR Objective 1-1: Migratory Waterfowl

Within 5 years of the date of this CCP, increase DED's from current level of 613,193 to 1,087,510 DEDs of managed waterfowl habitat that includes moist-soil, bottomland forest, un-harvested cropland, and forested swamp habitats, flooded to a depth of two feet or less, with sanctuaries (November 1 – February 28) sufficient to meet the habitat and population goals of the NAWMP as stepped-down through the LMVJV.

Discussion: Concern over waterfowl population declines in the 1980s resulted in establishment of the NAWMP, which focused the attention of federal, state, and private conservation groups on critical wintering and breeding areas. The LMVJV, which encompasses all four refuges in the Complex, was selected as one of the wintering habitat focus areas. One of the first tasks faced by the LMVJV was to develop a model or decision tool for determining how much habitat was needed, and a method for relating this objective to the population goals of the NAWMP. The solution was to consider wintering areas as responsible for contributing to the spring breeding population goals of NAWMP proportional to the percentage of ducks historically counted in wintering areas (Loesch et al. 1994, Reinecke and Loesch 1996). In order to contribute ducks to spring breeding populations, wintering areas must provide sufficient habitat to ensure adequate winter survival. To quantify winter habitat requirements, the LMVJV had to identify limiting factors and made an assumption that foraging habitat was the most likely factor to limit waterfowl populations in the LMV (Reinecke et al. 1989). The process of relating habitat objectives for individual management areas to overall habitat objectives for the LMV involved several steps (Biological Review for Big Lake and Wapanocca NWRs, USFWS 2007). Step-down objectives were established for Wapanocca NWR (Table 2). DED objectives were calculated by multiplying the acreage objective by the assumed DED standard developed by the LMVJV for that habitat type.

Table 2. LMVJV wintering duck forage objectives assigned to Wapanocca NWR, including current refuge forage production capabilities and the difference between assigned objectives and current capabilities (Revised Table 12 from Central AR NWR Complex CCP (USFWS 2009a)).

| Habitat Type with Water Mgt. Capability | Assigned Objective¹ Acres (DED)³ | Current Capability² Acres (DED)⁴ | Difference (+ or -) Acres (DED) |
|--|---|---|--|
| Moist-soil | 138 (257,784) | 115 ⁵ (214,820) | -23 (-42,964) |
| Bottomland Forest | 317 (39,942) | 41 (7,831) | -276 (-32,111) |
| Unharvested Crop | 85 (1,072,870) | 55 ⁶ (773,355) | -30 (-299,515) |
| Harvested Crop | 0 (0) | 0 (0) | 0 (0) |
| Forested Swamp | 0 (0) | 2,408 (91,504) | +2,408 (+91,504) |
| Total | 540 (1,370,596) | 2,619 (1,087,510) | +2,079 (-283,086) |

¹Acreage and DED objective provided by the LMVJV office.

²Current acreage and DED capability (has levees and water control structure, some have pumping capability) provided by refuge staff.

³DED estimates calculated using original LMVJV habitat DEDs/acre.

⁴DED estimates calculated using updated habitat DEDs/acre by the LMVJV Waterfowl Working Group in June 2006: moist-soil, 1,868 DEDs/ac; bottomland hardwood, 191 DEDs/ac; unharvested crop, 14,061 DEDs/ac (estimate based on actual acres of various grain crops left unharvested and flooded during the winter period); harvested crop, 287 DEDs/ac (estimate based on actual acres of various harvested grain crops flooded during the winter period), and forested swamp, 38 DEDs/ac (LMVJV 2007).

⁵Does not include moist-soil unit E-1/WF31 (9.7 acres), which is managed as emergent marsh.

⁶These acres may also be managed as moist-soil habitat. All moist-soil acreage may be managed as unharvested crop and vice versa.

In order to best achieve refuge purposes given the current and expected Canada goose use patterns at Wapanocca NWR and throughout the LMV, it is necessary to re-evaluate the current farming program which leaves upland unharvested crops for winter Canada goose forage. In the 1960's, the refuge's peak wintering Canada goose population averaged 1,000 birds, in the 70's 17,000 birds, in the 80's 15,000 birds, and in the 90's 6,000 birds. In the 2010's, the refuge's peak wintering Canada goose population averages 25 birds (likely year-round area-resident geese) which roost in Wapanocca Lake and do not feed in refuge uplands. Snow geese began wintering at the refuge in the 1970's and current annual peak population averages 40,000 birds. Snow geese are the primary waterfowl species feeding in the refuge's unharvested crops managed for winter Canada goose forage. The LMVJV has eliminated all goose-specific forage habitat objectives for the Refuge and remainder of the LMV. Additionally, the USFWS encourages refuges to decrease the availability of snow goose forage whenever possible. In response to these changes, the Refuge will cease annually providing upland unharvested crops for Canada geese and convert this farmed acreage to grassland/scrub-shrub habitat and bottomland hardwood forest. See Wapanocca NWR Objective 2-3 in Alternative B – (Proposed Alternative) for specific details in modifying this program.

The Refuge has 21 routinely floodable moist-soil units, totaling 180 acres. Unless intensively managed, the suitability of such units to provide needs of wintering waterfowl will decline. Greater flexibility is needed to intensify moist-soil management to include periodically cultivating these units as a means to set back woody encroachment and control pest plant invasions.

The Refuge has 11 additional moist-soil units, totaling 108 acres, which are not routinely floodable and have been reforested or are no longer managed as moist-soil habitat. The Refuge's wintering duck forage objective current capabilities (Table 2) reflect this reduction in manageable moist-soil unit area.

Flooded bottomland forest and forested swamp habitats not only provide food in the form of acorns, fleshy fruits, and invertebrates, but also provide cover, sanctuary, and nesting sites. However, the quantity of actual winter and early spring impounded bottomland hardwood forests and forested swamps provide only 7 percent of the Refuge's total assigned DEDs.

The Refuge's 600+ acre Wapanocca Lake is a site of major importance. Wapanocca Lake is the major regional sanctuary site for peaks of over 150,000 ducks and geese. Much care is needed to ensure the long-term biological integrity and environmental health of this lake system.

Another Refuge management practice of critical importance is maintaining a high degree of waterfowl sanctuary (area free of disturbance) in several areas within this relatively small refuge during key waterfowl use periods – November through February. Extensive movements and frequent flight induced by extensive disturbance can have immediate direct and subsequent indirect negative impacts to waterfowl. During this critical period, disturbance to waterfowl must be kept to a minimum to allow them to maintain proper body weight, conserve energy, and build fat and protein levels.

Strategies:

- Minimize human disturbance to wintering waterfowl on Wapanocca Lake by closing the lake to all public entry and use from November 1 through February 28, and limiting other activities, such as bird observation, use of observation blinds, and those aerial flyovers necessary for official avian surveys.
- Assess the current and expected waterfowl use of the Refuge. If Canada goose numbers of <12,000 per year are expected, then in conjunction with AGFC and the Service's Division of Migratory Birds, determine appropriate adjustments to the cooperative farming program to best achieve Refuge purpose and modify the cropland management program accordingly. Proposed modifications to current waterfowl habitat management practices (see Objectives 2-3 in Alternative B – (Proposed Alternative)) include:
 - Adjusting the types, acreages, and/or location of crops grown as necessary to provide forage that will be extensively used by wintering waterfowl;
 - Decreasing underutilized (by waterfowl) farmed acreages by converting such croplands to areas managed in grassland/scrub-shrub and bottomland hardwood forest habitats;
 - Intensifying and expanding moist-soil management practices in order to best accommodate waterfowl needs;
 - If additional cropland is later required to meet Canada goose forage objectives, return some grassland back to the farming program for use as winter green browse.

Under Goal 2 of the original CCP for the Wapanocca NWR, ***Protect, restore, and manage the functions and values associated with diverse bottomland hardwood forests and open wetland systems in order to achieve Refuge purposes, wildlife population objectives, and to benefit migratory waterfowl and other native wildlife***, the revised objective (Objective 2-3) is as follows:

Wapanocca NWR Objective 2-3: Cropland Habitat Management

From 2014-2017, convert 443 acres of upland cropland habitat (encompasses current cultivated area, cropland drainage ditch filter strips, and the cooperative farmer equipment staging area) to grassland/scrub-shrub and bottomland hardwood forest habitat, eventually phasing out upland farming by 2017. Continue to supplement naturally produced wintering waterfowl forage by annually providing up to 55 acres of unharvested crops in moist-soil units to contribute to the NAWMP wintering waterfowl forage objectives as stepped-down through the LMVJV.

Discussion: High-energy cereal grain crops artificially fill a void left by the loss of acorn-producing bottomland hardwood stands that once made up the majority of the habitats in the surrounding area. When these hardwood stands were cleared for farmland in the mid-1900s, a major component of the diet of wintering waterfowl was lost. The cereal grain crops planted through the Refuge's farming program assist in substituting for that natural food component during the harsh winter months when a high-energy diet is critically needed.

In 1984, an objective of 1,200,000 Canada Goose Use Days was established by the LMVJV for Wapanocca NWR and management of the Refuge's cropland habitat management program has since worked toward accomplishing that goal. However, the full utilization of crops grown for Canada Geese has only occurred in 3 years in the history of the refuge. Wapanocca NWR has not witnessed large numbers of Canada Geese in recent years, and the 52 acres of unharvested corn and 117 acres of winter wheat that have been the established minimum requirements to meet these goals have been severely under-utilized by wintering waterfowl. From 2010-2012, approximately 105 acres of unharvested corn were unused by Canada geese each winter. In 2007, the LMVJV eliminated all goose-specific forage objectives for Wapanocca NWR and the remainder of the LMV.

In recent years, wintering snow goose populations in the Mississippi Flyway have continued to increase and they are now the primary bird feeding in the Refuge's farmed uplands. The USFWS' *2007 Final Environmental Impact Statement: Light Goose Management* encourages refuges to decrease the availability of snow goose forage whenever possible (USFWS 2007).

The soil and topography of the Refuge farm units on Wapanocca NWR are somewhat diversified. The soil ranges from mild clays in the lower areas to slightly to extremely sandy loams in the upper hills. Historically, these lands provided a great diversity of plant life within a relatively small area, ranging from swampy bottoms to hardwood stands.

The National Wildlife Refuge System Improvement Act of 1997 directs the Service to ensure that the biological integrity, diversity, and environmental health (BIDEH) of the Refuge System are maintained for the benefit of present and future generations of Americans. In simplistic terms, elements of BIDEH are represented by native fish, wildlife, plants, and their habitats as well as those ecological processes that support them. The Service's policy on BIDEH (601 FW 3) also provides guidance on consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges, and associated ecosystems that represent BIDEH on each refuge.

The majority of the Refuge's 180 acres of moist-soil habitats should be cultivated on a rotational basis as needed in order to set back plant succession, control invasive plant species, and stimulate growth of native, moist-soil vegetation. Although these native plants do not provide the high-energy of cereal grain crops, they provide a nutritionally complete, balanced diet which is vital to the overall health of wintering waterfowl.

Strategies:

- Cease providing upland unharvested crops for Canada geese beginning in 2014, but continue to use cooperative farming on a 75:25 crop-share basis in 150 acres of uplands and 50 acres of moist-soil units annually through 2016. Additionally, Refuge staff will force account farm up to 5 acres of moist-soil units annually as staff refine this program.
- Begin Refuge force account farming of moist-soil units as required to contribute to LMVJV duck forage objectives in 2017.
- Monitor vegetation responses to habitat management practices and associated waterfowl use throughout the Refuge, as well as shifting trends in migratory bird use within the Mississippi Flyway, and adapt management of the moist-soil units as conditions warrant to ensure that the purposes of Wapanocca NWR are achieved and the Refuge can fulfill its necessary role within the context of the Mississippi Flyway.
- Modify existing landscape structure within the current upland cropland and grassland areas by reforesting up to 388 acres bordering the existing reforested areas and managing up to 227 acres, primarily in the Northeast Refuge corner (east of Ditch 4), as grassland/scrub-shrub habitat (Figures 2 and 3). If funding is not immediately available for reforesting this area, manage the planned reforestation areas as grassland/scrub-shrub habitat until funding is secured.
- Continue to administer the cooperative farming program in compliance with 50 CFR 29.1, 5 RM 17, 6 RM 4, and 603 FW 2 until its cessation in 2016.

Figure 2. Current land cover types, Wapanocca NWR.

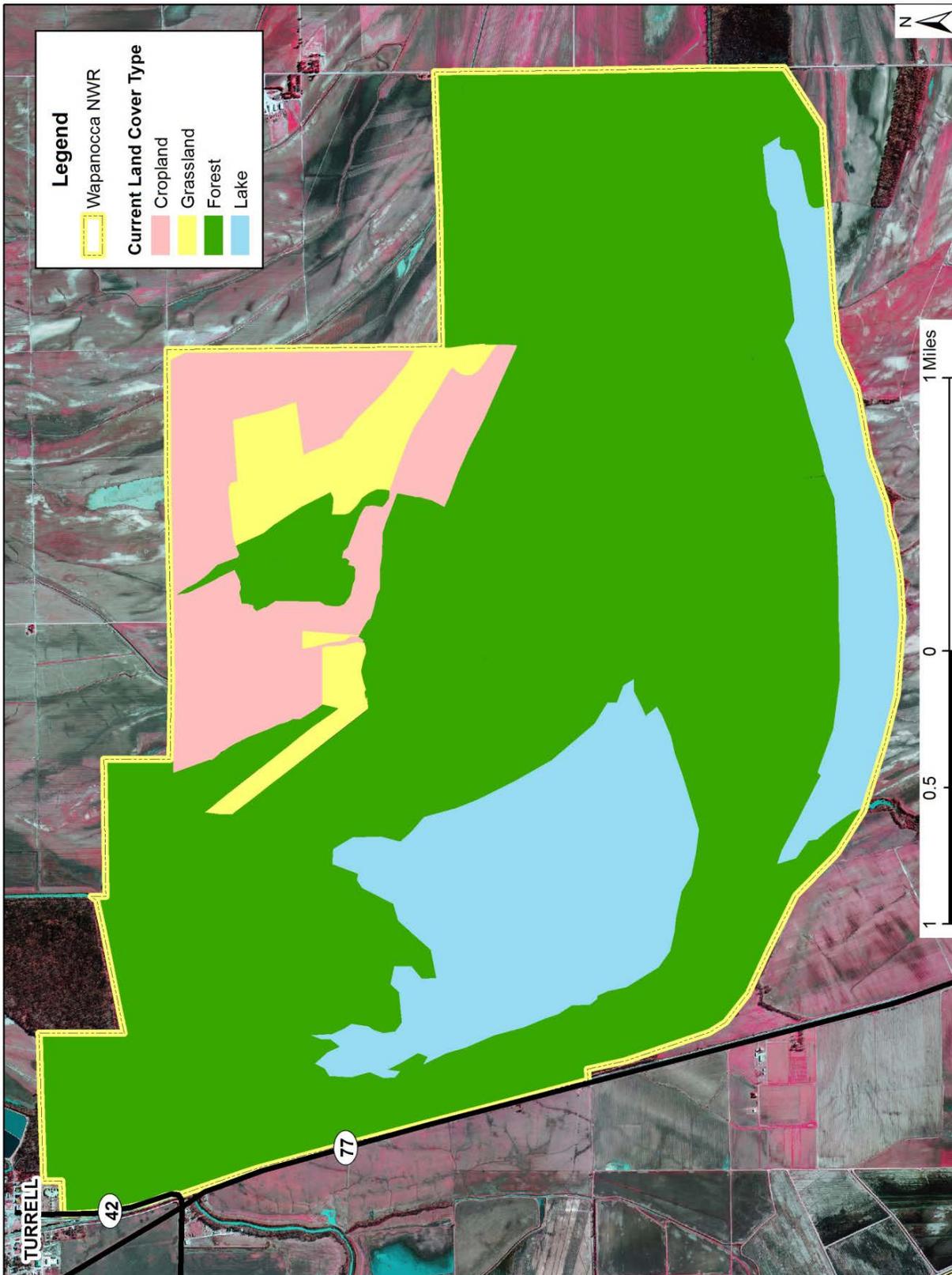
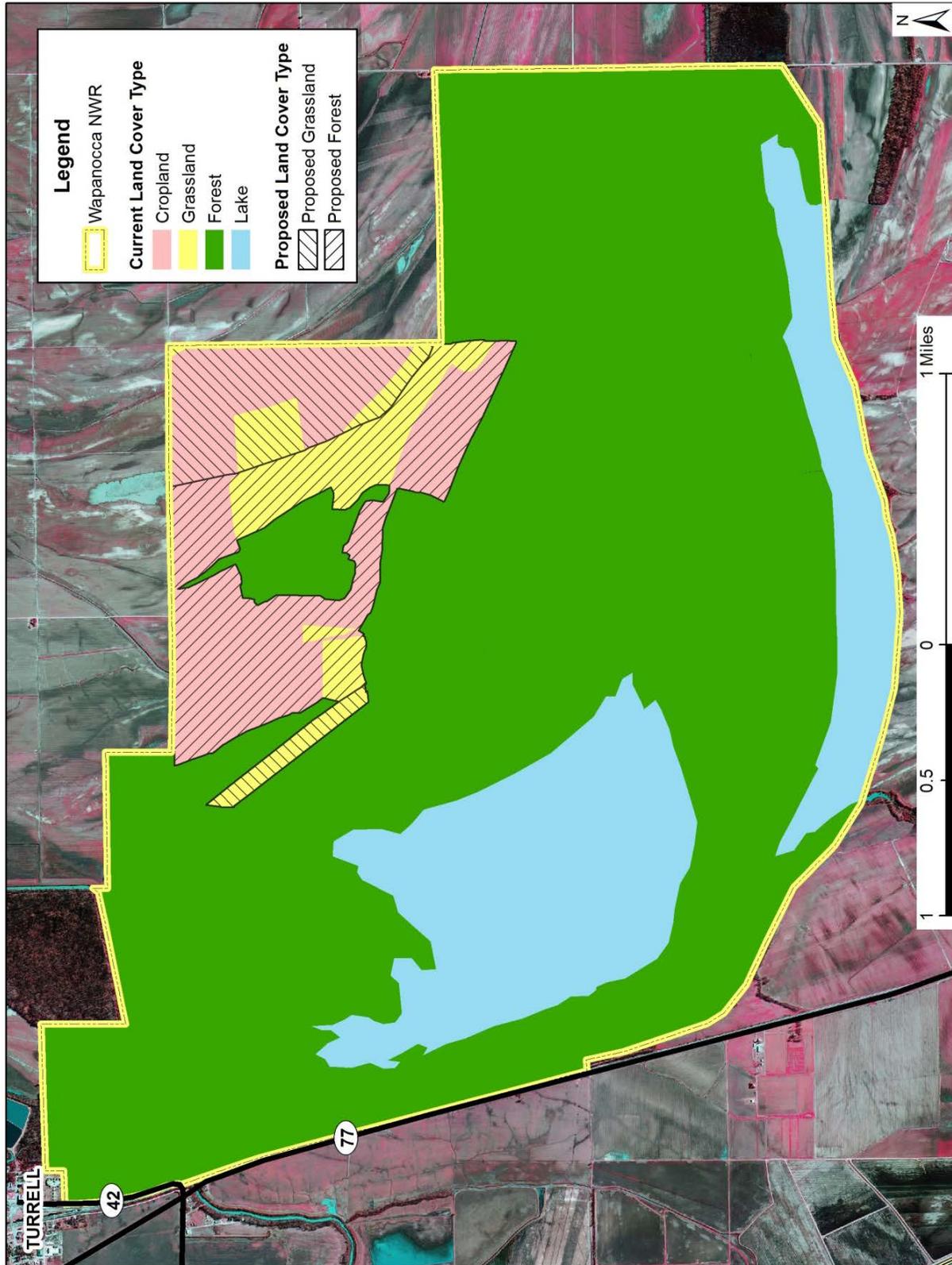


Figure 3. Proposed land cover types, Wapanocca NWR in 2017.



V. Plan Implementation

The following projects from the Central Arkansas NWR Complex CCP, Section A, Chapter V, Plan Implementation (USFWS 2009a; pages 226-227) are also revised. All other projects remain the same and are herein incorporated by reference (USFWS 2009a). The original descriptions of the revised projects (USFWS 2009a) are included below.

ORIGINAL PROJECTS

Grassland Restoration

This project will greatly improve the overall health of lands formerly incorporated into the refuge farm program; while at the same time have a positive impact on global warming and efforts with strategic habitat conservation. Planting of native warm-season grasses within 115 acres of higher elevation areas on Wapanocca NWR will restore the small prairie component currently missing on the refuge that historically occurred on high areas throughout the entire Mississippi Delta. Historically, these areas that bordered wetlands were very valuable as cover and nesting habitat for many species of migratory and resident birds. Native warm-season grasses have root systems up to 15 feet deep, which regenerate every 3 to 4 years, resulting in higher levels of organic matter, soil fertility, and increased carbon sequestration, which is helpful in battling global warming. Once established, these grass stands are very low maintenance, drought tolerant, and will add much needed habitat diversity for wildlife on the refuge and surrounding lands.

Estimated Cost \$105,062

(Linkages: Wapanocca NWR Objectives 1-5 and 1-6)

Bottomland Hardwood Forest Restoration

This project will restore 670 acres of bottomland hardwood forest on Wapanocca NWR. The refuge is located in northeast Arkansas and surrounded by a sea of farmland, which prior to conversion to agriculture, consisted primarily of bottomland hardwood forest habitat. Currently, the only remaining tracts of bottomland hardwood forest in northeast Arkansas lay within Wapanocca NWR. Recent changes in weather due to global warming have made these wetland systems more difficult to manage as historical patterns have been altered. This project will restore flood and drainage control within in these bottomland hardwood units, which will then allow Wapanocca NWR staff to mimic the flooding that historically occurred naturally within these forests. Past issues that have converted these forests to willow swamps will be corrected by restoration of levees, drainage facilities, and replanting of hardwood trees native to Wapanocca NWR.

Estimated Cost \$137,482

(Linkages: Wapanocca NWR Objectives 1-2, 1-7, and 2-2)

REVISED PROPOSED PROJECTS

The following projects from the Central AR NWR Complex CCP, Section A, Chapter V, Plan Implementation (USFWS 2009a; pages 226-227) are revised as follows:

Grassland/Scrub-Shrub Establishment

This project consolidates 172 acres of current, fragmented grassland and establishes an additional 55 acres of grassland into 200 acre and 27 acre blocks of grassland/scrub-shrub habitat at Wapanocca NWR. MAV grassland/scrub-shrub habitat and grassland bird populations have greatly declined during the past century. Although the Refuge was historically primarily bottomland hardwood forest, its sandy upland soils and proximity to the Mississippi River, a bird migration

corridor, make it an ideal site for establishing a large block of surrogate grasslands to contribute towards mitigating the loss of native prairie in the MAV. Selected fallow fields will naturally succeed to native broomsedge grass, forbs, and young trees that are manageable for grassland bird habitat under current management. Regionally native prairie grasses and forbs such as switchgrass, partridge pea, and ashy sunflower may be planted in the grasslands during their establishment or later interseeded into established grasslands. Long-term grassland management will necessitate periodic (2-3 year interval) treatments such as mowing, applying herbicides, light discing, and prescribed burning to control invasive species and prevent forest succession.

Two hundred acres of current cropland and grassland located northeast of Ditch Four will be managed as grassland/scrub-shrub habitat. Twenty-seven acres of current grassland/scrub-shrub habitat along Tananger Rd. will continue to be managed as grassland/scrub-shrub habitat. Although the 27 acre area is below the optimal size for grassland birds, this site will be accessible to Refuge birdwatchers and also serve as a demonstration site to educate visitors about grassland/scrub-shrub habitat management.

Estimated Establishment Cost: \$0 for only natural succession, \$28,375 for native grass and forb interseeding. Estimated Annual Maintenance Cost: \$2,724.
(Linkages: Wapanocca NWR Objectives 1-5 and 1-6)

Bottomland Hardwood Forest Restoration

This project will restore 388 acres of bottomland hardwood forest at Wapanocca NWR. The Refuge is one of the largest remaining forested blocks in Northeast Arkansas; however, its current forest core area is below the minimum size needed by many forest interior birds. Bottomland hardwood forest trees will be planted in 388 acres of current cropland and grassland habitat. This action will further expand the Refuge's forest core size by reconnecting it to an additional 90 acres of existing forest which are currently surrounded by cropland.

Estimated Cost: \$232,800
(Linkages: Wapanocca NWR Objectives 1-4, 1-5, and 2-2)

These revisions only change the aforementioned objectives and projects of the Wapanocca NWR Section of the Central AR NWR Complex CCP (USFWS 2009a). The remainder of the CCP and accompanying environmental analysis and appendices (USFWS 2009, USFWS 2009a) would remain in effect.

SECTION B. DRAFT ENVIRONMENTAL ASSESSMENT

I. Background

INTRODUCTION

The U.S. Fish and Wildlife Service (Service), Southeast Region, proposes to phase out upland cropland farming for migrant Canada geese and revise the Wapanocca National Wildlife Refuge (NWR) Comprehensive Conservation Plan (CCP) Goal 1, Objective 1-1 and Goal 2, Objective 2-3 (Pages 190-193 and 203-205 in USFWS 2009a). The CCP for Wapanocca NWR was included in the Central Arkansas National Wildlife Refuge Complex CCP for Bald Knob, Big Lake, Cache River and Wapanocca National Wildlife Refuges (USFWS 2009a). The original Environmental Assessment (EA) accompanying the Draft CCP for Central Arkansas NWRs Complex analyzed the environmental effects of the proposed alternative (USFWS 2009). This Environmental Assessment analyzes the environmental effects of phasing out the upland cropland farming program which is a deviation from the original CCP and EA analysis.

Wapanocca NWR was established on January 24, 1961, with the leasing of 3,119 acres from the Wapanocca Outing Club. On January 1, 1966, another 1,695 acres was added to the refuge. Currently, the refuge totals 5,620 acres and is located 20 miles northwest of Memphis, Tennessee, in Crittenden County, Arkansas.

The Refuge also administers two Farm Service Agency fee title tracts in St. Francis County. The Round Pond Unit contains 480 acres and the Pigmon Unit contains over 29 acres.

Wapanocca Lake is an oxbow lake formed when the Mississippi main channel changed its course. Subsequent flooding has deposited 5 to 6 feet of silt, creating what is now a shallow lake system. The refuge now remains as an island of wildlife habitat amidst a sea of agriculture. Habitat diversity includes agricultural land, grassland, bottomland hardwood forest, and flooded cypress/willow swamp.

The Refuge provides a wintering area for migratory waterfowl, a nesting habitat for resident wood ducks, and as a nesting grounds and migratory stopover area for forest breeding birds. Management activities include water, waterfowl, wetland, cropland, and forestry management, and providing compatible wildlife-dependent recreation.

The Environmental Assessment for the Refuge's draft CCP (USFWS 2009) analyzed three alternatives for future management of the Refuge, with Alternative C selected as the Preferred Alternative and more fully detailed in the CCP. Since the goals and most objectives and strategies from the original CCP have not been changed and were previously analyzed in the 2009 Environmental Assessment, only those objectives and strategies that have been modified are analyzed in this Environmental Assessment. The remainder of the original CCP and EA is incorporated herein by reference (USFWS 2009).

PURPOSE AND NEED FOR ACTION

The purpose of the environmental assessment is to evaluate each alternative to determine whether Wapanocca NWR should modify its original CCP objectives for the current upland farmed area to more effectively meet the mission of the National Wildlife Refuge System and ensure that Wapanocca NWR serves "...as an inviolate sanctuary, or for any other management purposes, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act, the establishing purpose of the refuge), and to fulfill the vision and goals identified in the Comprehensive Conservation Plan, other mandates, and special designations affecting the Refuge.

This environmental assessment addresses the need to revise the CCP for the Wapanocca NWR in order to: provide guidance for future Refuge management; meet the requirements of the National Wildlife Refuge System Improvement Act; and protect the Refuge's biological integrity, diversity, and environmental health.

DECISION FRAMEWORK

Based on the assessment described in this document, the Service will select an alternative to either revise or maintain the Comprehensive Conservation Plan for Wapanocca National Wildlife Refuge. The decision will include a Finding of No Significant Impact (FONSI), which is a statement explaining why the selected alternative will not have a significant effect on the quality of the human environment. This determination is based on an evaluation of the Service and Refuge System mission, the purpose(s) for which the Refuge was established, and other legal mandates. Assuming no significant impact is found, implementation of the revised plan will begin and will be monitored annually and revised when necessary.

AUTHORITY, LEGAL COMPLIANCE, AND COMPATIBILITY

The Service developed this revised plan in compliance with the National Wildlife Refuge System Improvement Act of 1997 and Part 602 of the Fish and Wildlife Service Manual (National Wildlife Refuge System Planning). The actions described within this revised plan also meet the requirements of the National Environmental Policy Act of 1969. The refuge staff achieved compliance with this Act through the involvement of the public and the incorporation of an environmental assessment in this document, with a description of the alternatives considered and an analysis of the environmental consequences of the alternatives (Chapters III and IV of the Environmental Assessment). When fully implemented, the revised plan will strive to achieve the vision and purposes of Wapanocca National Wildlife Refuge.

The revised plan's overriding consideration is to carry out the purposes for which the Refuge was established. The laws that established the Refuge and provided the funds for acquisition state the purposes. Fish and wildlife management is the first priority in refuge management, and the Service allows and encourages public use (wildlife-dependent recreation) as long as it is compatible with, or does not detract from, the Refuge's mission and purposes.

PROPOSED ACTION

This proposed action best serves the Refuge's purposes and vision, furthers the Refuge's CCP (2009a), revises some Refuge objectives and strategies, and provides additional details needed for on the ground implementation of habitat management actions. The Proposed Action continues Refuge management direction provided in the CCP, while enhancing Refuge management activities

related to migratory birds and their habitat. A full list of proposed changes can be found in Chapter III, Description of Alternatives.

PUBLIC INVOLVEMENT AND THE PLANNING PROCESS

In accordance with Service guidelines and National Environmental Policy Act recommendations, public involvement has been a crucial factor throughout the development of the revised Draft Environmental Assessment for Wapanocca National Wildlife Refuge. This Draft Environmental Assessment proposes a revision to the Central Arkansas NWR Complex CCP. The CCP was written with input and assistance from interested citizens, conservation organizations, and employees of local and state agencies. The participation of these stakeholders and their ideas has been of great value in setting the management direction for Wapanocca NWR. The Service, as a whole, and the Refuge staff, in particular, are very grateful to each one who has contributed time, expertise, and ideas to the planning process. The staff remains impressed by the passion and commitment of so many individuals for the lands and waters administered by the Refuge.

This EA will also go through a 30-day public review and comment period and a public meeting will be held in Turrell, Arkansas. A post card and news release will be sent out to everyone on the Central Arkansas NWR Complex Comprehensive Conservation Plan mailing list.

II. Affected Environment

For a complete description of the affected environment in addition to what is provided below, see Section A, Chapter II, Refuge Overview of the Central Arkansas NWR Complex CCP (USFWS 2009a) which is incorporated herein by reference. Updated and new information is incorporated below.

SOCIOECONOMIC ENVIRONMENT

Since the Service is proposing to modify the upland farming component only on Wapanocca NWR, we have provided updated socioeconomic data for Crittenden County, Arkansas. As of 2012, the total population in Crittenden County, Arkansas was 50,021. From 2007-2011, the median household income in Crittenden County, AR was \$35,264 (U.S. Census Bureau <http://quickfacts.census.gov/qfd/states/05/05035.html>). In March 2013, unemployment rate was 10.0% in Crittenden County, Arkansas (Federal Reserve Bank of St. Louis [http://research.stlouisfed.org/fred2/graph/?s\[1\]\[id\]=ARCTURN](http://research.stlouisfed.org/fred2/graph/?s[1][id]=ARCTURN)).

According to the 2007 USDA Arkansas Farm Bureau County Census of Agriculture, approximately 313,688 acres are farmed in Crittenden County, Arkansas on 566 farms. The average farm size is 1,193 acres. The Arkansas Farm Bureau of Economic Analysis estimated that the average net profit from these farms was about \$97,133 (USDA 2007).

III. Description of Alternatives

FORMULATION OF ALTERNATIVES

Alternatives are different approaches or combinations of management objectives and strategies designed to achieve the Refuge's purpose and vision, and the goals identified in the comprehensive conservation plan; the priorities and goals of the Gulf Coastal Plain and Ozarks Landscape Conservation Cooperative; the goals of the Refuge System; and the mission on the Fish and Wildlife Service. Alternatives are formulated to address the significant issues, concerns, and problems identified by the Service during the scoping process.

The two alternatives identified and evaluated in this EA represent different approaches to provide permanent protection, restoration, and management of the refuge's fish, wildlife, plants, habitats, and other resources, as well as compatible wildlife-dependent recreation. Refuge staff assessed the biological conditions and analyzed the external relationships affecting the Refuge. This information contributed to the development of Refuge goals and, in turn, helped to formulate the alternatives. As a result, each alternative presents different sets of objectives for reaching Refuge goals. Each alternative was evaluated based on how it would address the identified issues related to fish and wildlife populations, habitat management, resource protection and conservation, visitor services, and Refuge administration. A comparison of the two alternatives is provided in Table 3.

DESCRIPTION OF ALTERNATIVES

Serving as a basis for each alternative, a number of goals and sets of objectives were developed to help achieve the refuge's purpose and the mission of the Refuge System. Objectives are desired conditions or outcomes that are grouped into sets and, for this planning effort, consolidated into two alternatives. These alternatives represent different management approaches for managing the Refuge over the remainder of the CCP's 15-year time frame while still meeting the Refuge purposes and goals. The two alternatives are summarized below. A comparison of each alternative follows the general description.

ALTERNATIVE A - (CURRENT MANAGEMENT - NO ACTION)

This is the "status quo" alternative. Under this alternative, the Service would do nothing to change the following goals and objectives of the Wapanocca NWR Section of the Central AR NWR Complex CCP (USFWS 2009a). The entire CCP and accompanying environmental analysis (USFWS 2009) would remain.

Under Alternative A, cropland habitat management will continue on 498 acres annually. Snow geese will continue to be the primary bird benefitting from upland unharvested crops. 177 acres of fallow field habitat will remain in scattered blocks and would not provide a contiguous large block of habitat for grassland birds.

ALTERNATIVE B - (PROPOSED ACTION)

Under Alternative B, cropland habitat management will be reduced from 498 acres annually in 2013 to 230 acres in 2014 and then to 55 acres (located only in moist-soil impoundments) in 2017 causing changes in the habitat types available for wildlife. Upland unharvested crops will no longer be available to benefit snow geese; however, reforesting upland cropland habitat will create a larger block of bottomland forest habitat, thereby benefitting forest breeding birds. The Refuge will restore 388 acres of bottomland hardwood forest for forest birds and establish 55 acres of grassland/scrub-shrub habitat for grassland birds.

All other goals, objectives, strategies, and projects as described in the original CCP (USFWS 2009a) and accompanying EA (USFWS 2009) would remain as the preferred alternative for managing the Refuge through the remainder of the CCP's 15 year time frame.

FEATURES COMMON TO ALL ALTERNATIVES

The EA for the Central Arkansas NWR Complex CCP, Section B, Chapter III, Features Common to All Alternatives (USFWS 2009) is incorporated herein by reference and the changes to that analysis are provided below based on Alternative B (Table 3).

COMPARISON OF THE ALTERNATIVES BY ISSUE

Table 3. Comparison of the Alternatives by Issue

| Issues | Alternative A – Current Management (No Action Alternative) | Alternative B – Proposed Action |
|---------------------------------|--|--|
| Wintering Snow Geese | Continue to provide unharvested upland crops which primarily benefit wintering snow geese. | In 2014, cease providing unharvested upland crops which primarily benefit wintering snow geese. |
| Grassland and Scrub-shrub Birds | Maintain the existing 172 acres of grassland/scrub-shrub habitat in scattered blocks. | Expand and consolidate the grassland/scrub-shrub habitat into one optimally situated 200 and one 27 acre block. |
| Forest Birds | Maintain the current core forest area. | Expand the current core forest area by reforesting 388 acres and reconnecting an additional 90 acres. |
| Cropland Habitat | Continue to use cropland habitat management in uplands and moist-soil impoundments to set back succession and meet duck forage objectives. | Phase out all upland croplands by 2017. Continue to use cropland habitat management in moist-soil impoundments to set back succession and meet duck forage objectives. |

| Issues | Alternative A – Current Management (No Action Alternative) | Alternative B – Proposed Action |
|--------------------|---|---|
| Moist-Soil Habitat | Continue to periodically set back succession and control undesirable plants by cultivating hot foods. | Continue to periodically set back succession and control undesirable plants by cultivating hot foods. |

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

The alternatives development process under NEPA and the National Wildlife Refuge System Improvement Act is designed to allow consideration of the widest possible range of issues and potential management approaches. During the alternatives development process, many different solutions were considered. The following alternative components were considered but not selected for detailed study in this draft comprehensive conservation plan revision and environmental assessment for the reason(s) described.

Use Force Account farming to keep the acreage of farmland the same as the No Action Alternative. Although the Service has the capabilities to force account farm Refuge impoundments, the equipment and funding are currently unavailable for additional large scale farming in Refuge uplands. Also, the upland farming benefits to snow geese directly conflict with Service policies (see *Final Environmental Impact Statement: Light Goose Management, USFWS 2007*) and are not the most effective option for fulfilling the Refuge purpose.

Abruptly end cooperative farming on the refuge instead of using a phased approach. By abruptly ending cooperative farming, the Service felt undue hardship would be placed on the cooperative farmer. The Service believes a phased approach to ending upland farming on the Refuge would lessen this economic yet meet the wildlife resource needs over time.

IV. Environmental Consequences

OVERVIEW

This section analyzes and discusses the potential environmental effects or consequences that can be reasonably expected by the implementation of each of the two alternatives described in Chapter III of this EA. The EA for the Central Arkansas NWR Complex CCP, Section B, Chapter IV, Environmental Consequences (USFWS 2009) is incorporated herein by reference and any changes to that analysis are provided below. For each alternative, the expected outcomes are portrayed throughout the remainder of the plan's 15 year timeframe.

EFFECTS COMMON TO ALL ALTERNATIVES

The "Effects Common to All Alternatives" section of the EA for the Central Arkansas NWR Complex CCP, Section B, Chapter IV, Environmental Consequences (USFWS 2009) continues to apply and the new alternative has not changed this analysis except the "Other Effects" subsection has been updated and moved under "Summary of Effects by Alternative" below.

OTHER EFFECTS

Each of the alternatives would have similar effects or minimal to negligible effects on noise, transportation, human health and safety, children, hazardous materials, waste management, aesthetics and visual resources, and utilities and public services.

SUMMARY OF EFFECTS BY ALTERNATIVE

The following section describes the environmental consequences of adopting each refuge management alternative. The EA for the Central Arkansas NWR Complex CCP, Section B, Chapter IV, Environmental Consequences (USFWS 2009) is incorporated herein by reference and any changes to that analysis are provided below. Table 4 summarizes and addresses the likely outcomes for the specific issues.

Under Alternative A, cropland habitat management will continue on 498 acres annually. Snow geese will continue to be the primary bird benefitting from upland unharvested crops. The 177 acres of grassland habitat will remain in scattered blocks and would not provide a contiguous large block of habitat for grassland birds.

Under Alternative B, cropland habitat management will be reduced from 498 acres annually in 2013 to 230 acres in 2014 and then to 55 acres (located only in moist-soil impoundments) in 2017 causing changes in the habitat types available for wildlife. Upland unharvested crops will no longer be available to benefit snow geese; however, reforesting upland cropland habitat will create a larger block of bottomland forest habitat, thereby benefitting forest breeding birds. The Refuge will restore 388 acres of bottomland hardwood forest for forest birds and establish 55 acres of grassland/scrub-shrub habitat for grassland birds.

Under Alternative B, there would also be socioeconomic effects; however, these economic impacts would occur over time as the project is phased into place and the land is gradually removed from cooperative farming. These resultant economic impacts would not significantly affect the entire community; however, the cooperative farmer would no longer benefit from refuge farming income once farming is phased out. Alternative B will also positively impact the local economy as refuge visitation increases in response to the larger deer and songbird populations resulting from the expanded natural habitats.

Under Alternative A, accelerated soil erosion in farmed Refuge uplands will continue. Under Alternative B, accelerated soil erosion will cease once trees and permanent grassland cover are established. Under Alternative A, water quality in Refuge waterways and farther downstream will continue to be impacted by sediment, fertilizer, and herbicide runoff from farmed Refuge uplands. Under Alternative B, water quality in Refuge waterways and farther downstream will no longer be impacted by runoff from farmed Refuge uplands following the end of upland farming in 2017.

UNAVOIDABLE IMPACTS AND MITIGATION MEASURES

Under Alternative A—the no-action alternative—there are several unavoidable impacts. The Refuge will be unable to increase its bottomland hardwood forest area by 388 acres and its grassland/scrub-shrub area by 55 acres. Accelerated erosion of farmed upland soils will continue, impacting the fields' long-term wildlife habitat potential and water quality in Refuge waterways. Snow geese will continue to be the primary bird benefitting from the Refuge's unharvested upland crops.

Alternative B, the proposed alternative, also has unavoidable impacts. Annual management expenses will increase when the Refuge begins force account farming all acres needed to meet LMVJV duck forage objectives. Additional staff time will be required for expanded force account farming, however this would be somewhat offset by staff no longer administering the cooperative farming program. Off-Refuge snow goose crop depredation may increase slightly, however most refuge-area snow goose foraging currently occurs on private lands and the Refuge may attract fewer snow geese once on-Refuge unharvested cereal grains are no longer present. Off-Refuge crop depredation by deer will increase if the Refuge deer population increases due to on-Refuge habitat restoration.

WATER QUALITY FROM SOIL DISTURBANCE AND USE OF HERBICIDES

Water quality will improve following bottomland hardwood forest and grassland/scrub-shrub restoration because these habitats' long-term management requires very little soil disturbance. Long-term herbicide use for exotic plant control in bottomland hardwood forests and grassland/scrub-shrub areas could impact water quality however the overall volume of applied herbicide would be much lower than when the area was cropland.

WILDLIFE DISTURBANCE

Wildlife disturbance will decrease following bottomland hardwood forest restoration and grassland/scrub-shrub establishment because these habitats provide greater year-round visual barriers and escape cover than cropland.

Table 4. Summary of environmental effects by alternative, Wapanocca National Wildlife Refuge

| Issues | Alternative A (Current Management – No Action) | Alternative B (Proposed Action) |
|---|---|---|
| Water Quality | Water quality will continue to be impacted by accelerated erosion from farmed upland soils. | Water quality will no longer be impacted by accelerated erosion from farmed upland soils once the habitat restoration is completed. |
| Wildlife Disturbance | Wildlife disturbance will continue at the current level. | Wildlife disturbance will decrease once the habitat restoration work is completed. |
| User Group Conflicts | User group conflicts are unlikely to occur. | User group conflicts are unlikely to occur. |
| Cooperative Farmer | Part of the cooperative farmer's income will continue to be derived from Refuge farming. | The cooperative farmer would no longer benefit from income derived on the Refuge once cooperative farming is phased out in 2017. |
| Effects on Adjacent Landowners | Effects on adjacent landowners will continue at the current level. | Crop depredation by snow geese and deer may increase slightly. |
| Landownership and Site Development | No likely effects. | No likely effects. |
| Economic Impacts | No likely effects. | Increased public use and visitation due to expanded natural habitats will benefit local businesses. |

USER GROUP CONFLICTS

Public use of the affected areas will increase once bottomland hardwood forest and grassland/scrub-shrub habitats are restored. User group conflicts have not occurred in similar Refuge areas and are not expected under the proposed action. Should this occur, the Refuge will adjust its programs as needed, to eliminate or minimize any public use issues. The Refuge will use methods that have proven to be effective in reducing or eliminating public use conflicts including: establishing separate use areas, different use periods, and limits on the numbers of users in order to provide safe, quality, appropriate and compatible wildlife-dependent recreational opportunities.

COOPERATIVE FARMER

There will be unavoidable economic impacts to the cooperative farmer as the Refuge's cropland area is reduced. The refuge will mitigate these effects by Phasing out cooperative farming over a three year period.

ADJACENT LANDOWNERS

Snow goose crop depredation may decrease in adjacent winter wheat fields if the Refuge attracts fewer snow geese once upland unharvested cereal grains are no longer present. Deer crop depredation may increase when the Refuge deer population increases due to the additional natural habitat, however it is expected to remain at very low levels.

LAND OWNERSHIP AND SITE DEVELOPMENT

Implementation of the proposed action will not affect land ownership near the Refuge. The proposed action does not entail site development.

CUMULATIVE IMPACTS

A cumulative impact is defined as an impact on the natural or human environment, which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions (40 Code of Federal Regulations, 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can "accumulate" spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially canceling out each other's effect on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource. In addition, sometimes the overall effect is greater than merely the sum of the individual effects, such as when one more reduction in a population crosses a threshold of reproductive sustainability, and threatens to extinguish the population.

A thorough analysis of impacts always considers their cumulative aspects, because actions do not take place in a vacuum: there are virtually always some other actions that have affected that resource in some way in the past, or are affecting it in the present, or will affect it in the reasonably foreseeable future. So any assessment of a specific action's effects must in fact be made with consideration of what else has happened to that resource, what else is happening, or what else will likely happen to it.

The implementation of the alternatives includes actions relating to wildlife habitat restoration and administrative programs changes. These actions would have both direct and indirect effects (e.g., private land crop depredation) however the cumulative negative effects of these actions over the remainder of the CCP's 15 year time frame would not be significant and are far outweighed by the anticipated positive impacts. In addition to the EA for the Central Arkansas NWR Complex CCP, Section B, Chapter IV, Environmental Consequences (USFWS 2009) which is incorporated herein by reference and there are no new impacts. The Refuge is not aware of any past, present, or future planned actions that would result in a significant cumulative impact when added to the refuge's proposed actions, as outlined in the proposed alternative.

DIRECT AND INDIRECT EFFECTS OR IMPACTS

Direct effects are caused by an action and occur at the same time as the action. Indirect effects are caused by an action but are manifested later in time or further removed in distance, but still reasonably foreseeable.

The actions proposed for implementation under the proposed alternative include wildlife habitat restoration and administrative programs changes. These actions would result in both direct and indirect effects. Grassland/scrub-shrub habitat restoration, for example, would lead to an increased Refuge grassland bird population, a direct effect; and it, in turn, would lead to indirect effects such as increased Refuge visitation by birdwatchers and the resultant increase in birdwatcher purchases from local businesses.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The habitat restoration actions proposed under the proposed alternative are dedicated to maintaining the long-term productivity of Refuge lands for migratory birds. The benefits of this plan for long-term productivity far outweigh any impacts from short-term actions, such as eliminating upland crops or planting bottomland hardwood forest trees in several current fallow fields. While these activities would cause short-term negative impacts, the forest bird habitat value gained from this action would result in greater long-term benefits.

V. Consultation and Coordination

OVERVIEW

This chapter summarizes the consultation and coordination that has occurred to date in identifying the issues, alternatives, and proposed alternative, which are presented in this CCP. It lists the meetings that have been held with the various agencies, organizations, and individuals who were consulted in the preparation of the CCP.

A 30-day public review and comment period for the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for the Central Arkansas National Wildlife Refuge Complex was published in the *Federal Register* on August 27, 2009 (74 FR 43716). A mailing list, representing conservation organizations, private landowners, public citizens, tribal governments, and state and federal government agencies, was compiled during the development of the Draft CCP/EA. Copies of the Draft CCP/EA were distributed for review to those on the list, as well as to all others as requested, and were available to the public at each of the four refuge offices in the Complex. Additionally, public notices and press releases were published in multiple area-wide newspapers to announce five open house meetings to provide additional information and opportunities for public comments on the Draft CCP/EA. The five meetings occurred from 5 to 8 p.m. as follows: September 15, 2009 at the Bald Knob Municipal Building, 3713 Highway 367, Bald Knob, Arkansas; September 17, 2009 at the Brinkley Convention Center, 1501 Weaterby Drive, Brinkley, Arkansas; September 21, 2009 at the Manila Community Center, 855 Airport Road, Manila, Arkansas; September 22, 2009 at the Wapanocca National Wildlife Refuge Headquarters, Highway 42 East, Turrell, Arkansas; and September 24, 2009 at the National Guard Armory, 500 Highway 64 East, Augusta, Arkansas. Twenty-four individuals attended the open houses where two oral and two written comments were received. Six additional comments were received by mail and four by e-mail.

This revision and EA will also go through a 30-day public review and comment period and a public meeting will be held in Turrell, Arkansas. The Service will also consult and coordinate with the Arkansas Game and Fish Commission, LMVJV, and the USFWS Office of Migratory Bird Management.

Appendix A. Literature Cited

The Final CCP for the Central Arkansas NWR Complex CCP, Appendix A, Literature Cited Section and all other original Appendices (USFWS 2009a) are incorporated herein by reference and any additions are provided below.

Federal Reserve Bank of St. Louis. 2013. Unemployment Rate in Crittenden County, AR (ARCTURN). Source: U.S. Department of Labor: Bureau of Labor Statistics. [http://research.stlouisfed.org/fred2/graph/?s\[1\]\[id\]=ARCTURN](http://research.stlouisfed.org/fred2/graph/?s[1][id]=ARCTURN)

U.S. Department of Commerce, U.S. Census Bureau. 2012b. State and County Quick Facts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report. Washington, DC. <http://quickfacts.census.gov/qfd/states/00000.html> (Accessed 3/21/2012).

U.S. Department of Commerce, U.S. Census Bureau. 2012c. USA Quick Facts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report. Washington, DC. <http://quickfacts.census.gov/qfd/states/00000.html> (Accessed 3/21/2012).

U.S. Department of Agriculture. 2007. National Agriculture Statistics Service. Arkansas Census of Agriculture by County.

U.S. Fish and Wildlife Service. 2009. Central Arkansas National Wildlife Refuge Complex Draft Comprehensive Conservation Plan and Environmental Assessment. 567 pp.

U.S. Fish and Wildlife Service. 2009a. Central Arkansas National Wildlife Refuge Complex Comprehensive Conservation Plan. 523 pp.

U.S. Fish and Wildlife Service. 2007. Final Environmental Impact Statement: Light Goose Management. 254 pp.

Appendix B. Intra-Service Section 7 Biological Evaluation

REGION 4 INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Bill Peterson
Telephone Number: 870-343-2595 **E-Mail:** bill_peterson@fws.gov
Date: November 14, 2013

PROJECT NAME (Grant Title/Number):
Bottomland Hardwood Forest and Grassland Restoration at Wapanocca NWR

- I. Service Program:**
- Ecological Services
 - Federal Aid
 - Clean Vessel Act
 - Coastal Wetlands
 - Endangered Species Section 6
 - Partners for Fish and Wildlife
 - Sport Fish Restoration
 - Wildlife Restoration
 - Fisheries
 - Refuges/Wildlife

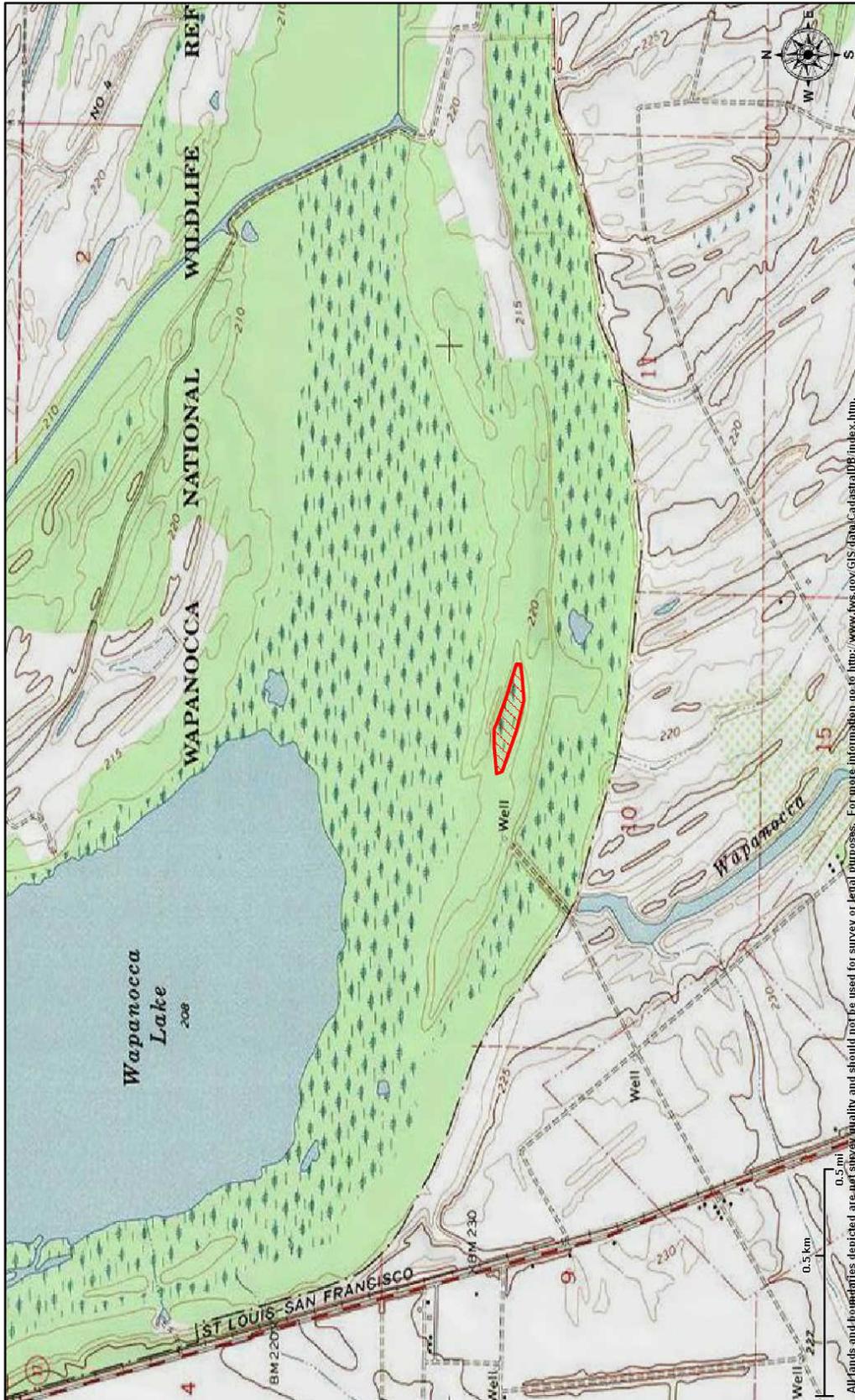
II. State/Agency: N/A

III. Station Name: Wapanocca NWR

IV. Description of Proposed Action (attach additional pages as needed):

The refuge proposes to convert 443 acres of cropland to 388 acres of bottomland hardwood forest and 55 acres of grassland/scrub-shrub. This restoration area is located >1.5 miles from the nearest pondberry population.

V. Pertinent Species and Habitat:

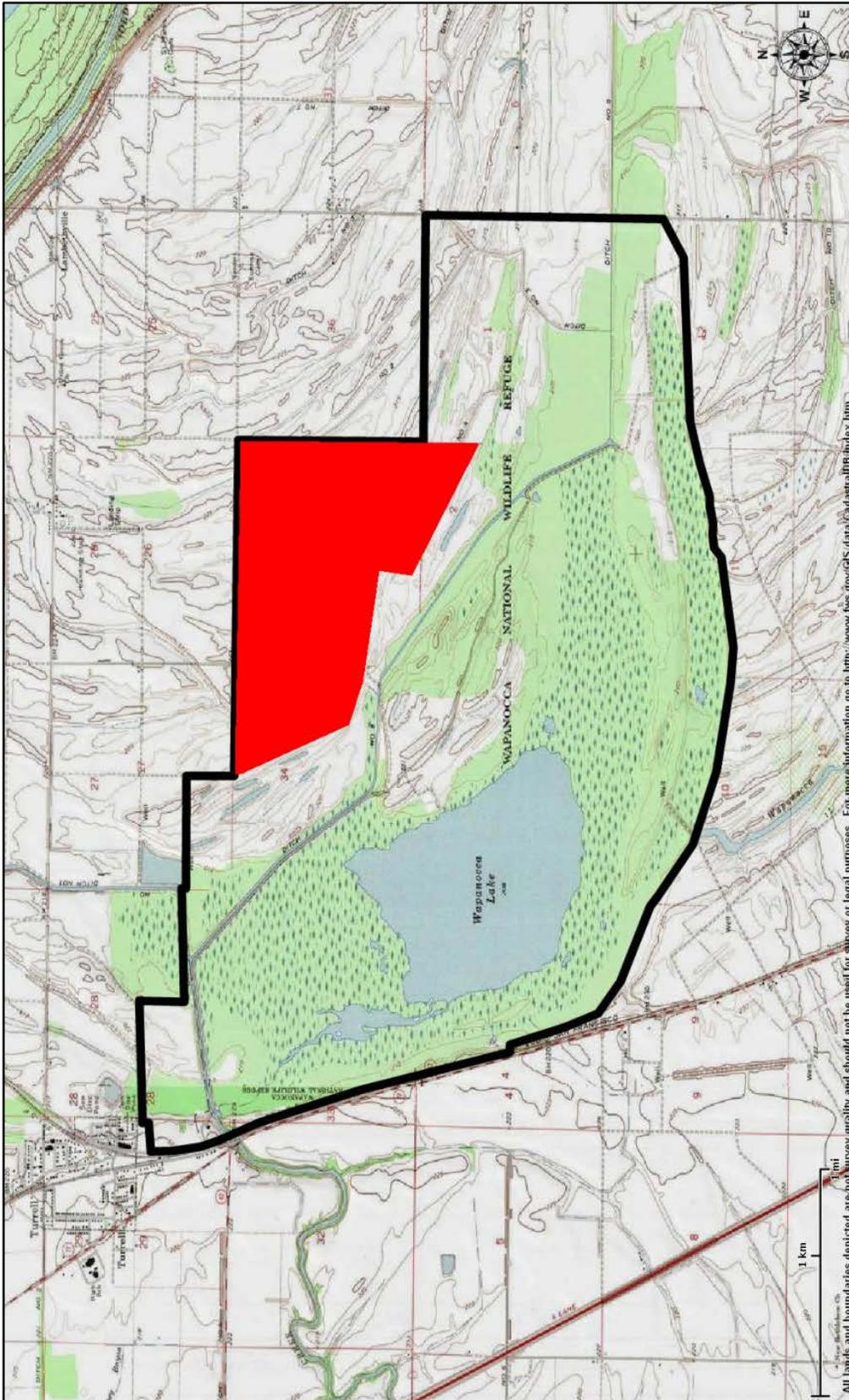


Complete the following table:

| SPECIES/CRITICAL HABITAT | STATUS ¹ |
|---|---------------------|
| Pondberry (<i>Lindera melissifolia</i>) | E |
| | |
| | |

¹STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. Location:



A. Ecoregion Number and Name:

Ecosystem Area I, Ecosystem 27: Mississippi Alluvial Valley

B. County and State:

Crittenden County, Arkansas

C. Section, township, and range (or latitude and longitude):

Sections 34 and 34 of Twp. 9N – Rge. 8E and section 2 of Twp. 8N – Rge. 8E.

D. Distance (miles) and direction to nearest town:

1.5 miles southeast of Turrell, Arkansas.

E. Species/habitat occurrence:

Pondberry – Discovered in Oct, 2012 in a wet depression in Pecan Ridge.

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item (attach additional pages as needed):

| SPECIES/CRITICAL HABITAT | IMPACTS TO SPECIES/CRITICAL HABITAT |
|--------------------------|--|
| Pondberry | No cropland conversion will occur within 1.5 miles of known pondberry plants. All activities will occur in prior-disturbed areas, which are unsuitable pondberry habitat. Pondberry colonies at Wapanocca are limited to one depression area. In October 2012, after the plant's discovery, refuge staff surveyed Wapanocca NWR for additional plants. |

B. Explanation of actions to be implemented to reduce adverse effects:

| SPECIES/CRITICAL HABITAT | ACTIONS TO MITIGATE/MINIMIZE IMPACTS |
|--------------------------|--|
| Pondberry | 1. No cropland conversion within 1.5 miles of pondberry plants. 2. Cropland conversion only in prior-disturbed areas. |

VIII. Effect Determination and Response Requested:

| SPECIES/ CRITICAL HABITAT | DETERMINATION ¹ | | | RESPONSE ¹ REQUESTED |
|------------------------------|----------------------------|----|----|------------------------------------|
| | NE | NA | AA | |
| Pondberry | X | | | No |
| | | | | |
| | | | | |

¹ DETERMINATION/RESPONSE REQUESTED:

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a "Concurrence".

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response Requested for proposed or candidate species is "Conference".