NRCS Natural Resources Conservation Service

Wetland Reserve Program

Final
Programmatic Environmental Assessment

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TABLE OF CONTENTS

1.0 SECTION 1 – INTRODUCTION

1.1 PROGRAM OVERVIEW 1
1.2 PROGRAM OPERATION 2
1.3 STATUTORY REQUIREMENTS 5

2.0 SECTION 2 – NEED FOR ACTION 6

3.0 SECTION 3 – ALTERNATIVES 7

3.1 ALTERNATIVE SCOPING AND PUBLIC INVOLVEMENT 7
3.2 ALTERNATIVE 1: NO ACTION 7
3.3 ALTERNATIVE 2: IMPLEMENTATION OF 2008 WRP REQUIREMENTS 7

4.0 SECTION 4 – ENVIRONMENTAL IMPACTS OF ALTERNATIVES 11

4.1 SCOPE OF ANALYSIS 11
4.2 IMPACTS TO SOIL RESOURCES 12

4.2.1 Benchmark Conditions 12
4.2.2 Alternative 1 – No Action Alternative 14
4.2.3 Alternative 2 – 2008 WRP Program Requirements 14

4.3 IMPACTS TO WATER RESOURCES 15

4.3.1 Benchmark Conditions 16
4.3.2 Alternative 1 – No Action Alternative 16
4.3.3 Alternative 2 – 2008 WRP Program Requirements 18

4.4 IMPACTS TO AIR RESOURCES 21

4.4.1 Benchmark Conditions 21
4.4.2 Alternative 1 – No Action Alternative 21
4.4.3 Alternative 2 – 2008 WRP Program Requirements 21

4.5 IMPACTS TO BIOLOGICAL RESOURCES 22

4.5.1 Benchmark Conditions 22
4.5.2 Alternative 1 – No Action Alternative 23
4.5.3 Alternative 2 – 2008 WRP Program Requirements 24

4.6 IMPACTS TO HUMAN RESOURCES 32

4.6.1 Benchmark Conditions 32
4.6.2 Alternative 1 – No Action Alternative 32
4.6.3 Alternative 2 – 2008 WRP Program Requirements 33

4.7 CUMULATIVE EFFECTS 38

5.0 SECTION 5 – LIST OF PERSONS AND AGENCIES CONSULTED 39

6.0 SECTION 6 – APPENDICES 40

APPENDIX A – NRCS NATIONAL RESOURCE CONCERNS 40

1.0 INTRODUCTION

1.1 Program Overview

The conversion of native habitats to cropland led to the drainage and alteration of almost 54 percent of the wetlands in this country, with some States losing as much as 90 percent from the 1780s to the 1980s. In recent years, increasing knowledge about the importance of wetland functions has led to policy changes, including the creation of the Wetlands Reserve Program (WRP), which have significantly decreased the loss of wetland acreage and moved the national focus toward restoring wetlands. WRP is a major contributor for achieving the Nation's goal of "no net loss" of wetlands. The United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS), with voluntary participation by landowners and cooperation of many partners, has restored and protected more than one million acres of wetlands and associated uplands through WRP. Lands enrolled in WRP provide habitat for wildlife, decrease flood damages, improve water quality, enhance traditional cultural opportunities for American Indians, help the recovery of endangered and threatened species, and allow farmers and others to maintain ownership of lands suited for wetland restoration. In 1990, Congress authorized WRP as part of the Food Security Act (Farm Bill) of 1985. WRP has been reauthorized or amended in every Farm Bill since 1990.

WRP is administered by NRCS which provides technical and financial assistance to eligible landowners to restore, enhance, and protect wetlands through 30-year or perpetual easements or restoration cost-share agreements. The goal of the program is to restore wetland functions and values to natural conditions to the extent practicable, while maximizing wildlife habitat values (see http://www.nrcs.usda.gov/programs//wrp/). WRP has filled a unique conservation niche in this landscape. WRP completes full hydrologic restoration of enrolled basins and shifts management to the private landowner with assistance from the NRCS. This provides clear benefits for migratory birds and other wetland dependant species as WRP tracts are actively managed for optimal wetland wildlife habitat and the juxtaposition of WRP tracts complements adjacent public properties.

WRP is a NRCS program under which private landowners voluntarily enroll eligible lands with degraded wetland features. NRCS may acquire a perpetual or 30-year easement and completes wetland and upland restoration of the tract. NRCS may also enroll land through a restoration cost-share agreement which does not include an easement. As of 2007, more than 1.9 million acres of wetlands and associated uplands have been enrolled in WRP nationwide. During the early years of the program, a minimalist approach to restoration was taken where limited restoration actions were completed with the expectation that natural wetland and vegetative succession would return wetland function. After 1996, greater emphasis was placed on restoring wetland hydrology and topologic features to ensure that maximum wildlife benefits were achieved, particularly for migratory birds and other wetland dependant species (NRCS 2002).

1.2 Program Operation

NRCS provides financial assistance in the form of easement payments and restoration cost-share assistance, and provides technical assistance for restoration and wetland management.

Enrolled lands are mostly restorable agricultural wetlands. All States and Puerto Rico have active WRP projects. The top 10 States in terms of enrollment are Louisiana, Arkansas, Mississippi, California, Florida, Missouri, Iowa, Texas, Minnesota, and Oklahoma. Nationally, the full average project cost per acre is approximately $1,278.00, and the average project size is approximately 190 acres.

Landowners have three program participation options:

- Short-term restoration cost-share agreements;
- 30-year conservation easements; and
- Permanent easements.

Landowners participating in WRP continue to control access, have use of non-developed recreational activities such as hunting and fishing, and maintain the right to lease the recreational uses of their land for financial gain, provided this use does not otherwise impact or conflict with other uses prohibited by the warranty easement deed. At any time during the contract period, landowners may request NRCS' approval of other prohibited uses that may be compatible with wetland and wildlife conservation objectives of the program. WRP funds and subsequent lease revenue provide financial relief to landowners and reduce future disaster assistance needs.

WRP restoration planners are designing new and innovative techniques to restore wetlands to maximize wildlife benefits and ensure the aesthetic quality of the landscape. Table 1.2.1 provides a summary of the principle conservation practices and amounts applied from fiscal year (FY) 2004 through FY 2007. Figure 1.2.1 illustrates the predominant location of applied conservation practices. Historically, wetland restoration consisted primarily of straight dikes and levees and flat wetland basins created by years of agricultural use. NRCS now emphasizes micro and macro-topographic features that create a diversity of water depths and habitats, which enhance biological diversity. In addition, levees and dikes are being constructed in serpentine patterns and lower heights so that they blend into the landscape and create small pockets of sheltered wetlands. For the past several years, NRCS has conducted many workshops on restoring hydrological diversity on agricultural practices. Now, NRCS is incorporating innovative topographic features into restorations that provide a diversity of habitat for amphibians, reptiles, and birds.

In this aerial view, the serpentine channels have been pushed out exposing the dark organic soil. The work was completed using a D6-Low Ground Pressure Cat with a 15 foot, 6-way blade. The channels are two to four feet deep and 60 to 80 feet in width. There are over 50,000 linear feet of channel on the property. The small shallow water wildlife habitat areas, or "push outs" are 1/4 to 1/2 acre in size, irregular in shape, and are two to five feet in depth. There are over 120 "push-outs" on the property. After the earth work was completed, there were over 140 tile breaks made to complete the hydrological restoration. (Michigan).

Mechanical excavation increases micro topographic complexity that benefit a diversity of wetland wildlife on WRP sites in the Arkansas River Valley. (Kiah Gardner, Arkansas Game and Fish Commission)

Figure 1.2.1 WRP Acres Enrolled, FY 2007 WRP

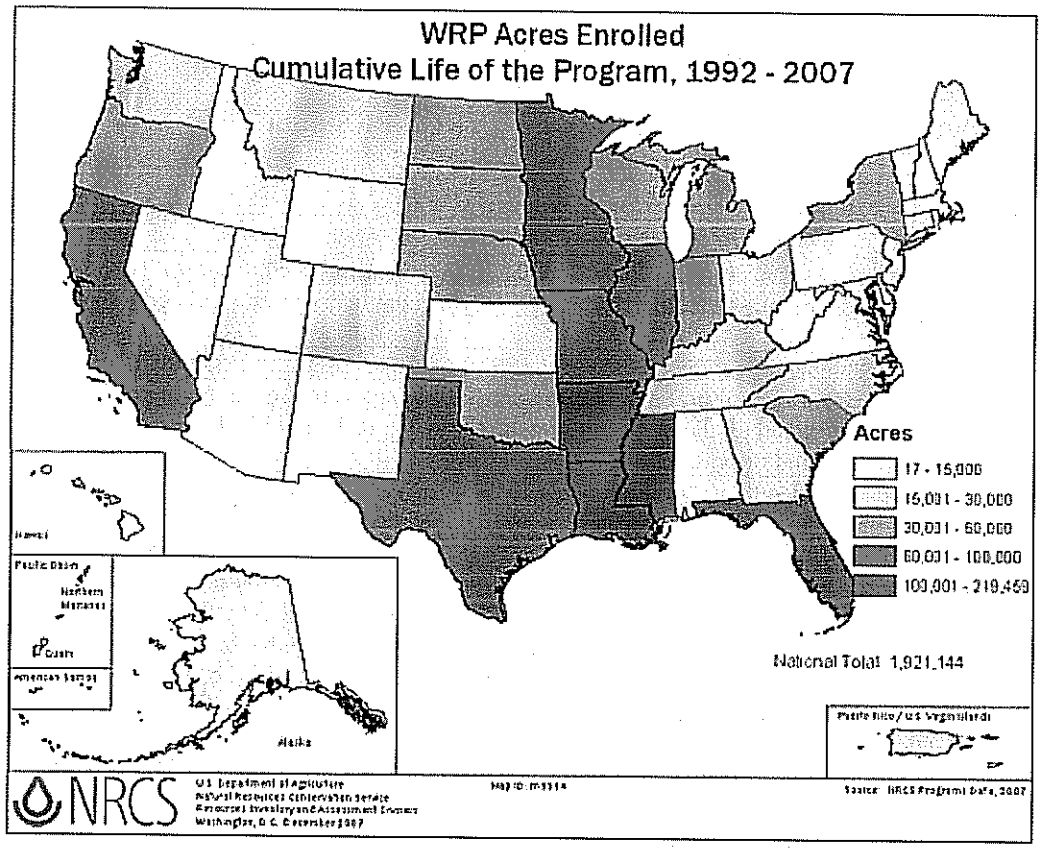


Table 1.2.1 Practices Applied Through WRP in FY 2004-FY 2007

Practice	Unit	Applied Amt. FY'04	FY 05	FY 06	FY 07	Total
Brush Management	ac	2,129.50	564.00	1,234.80	700.90	4,629.20
Diversion	ft	1,140.00	0.00	500.00	4,000.00	5,640.00
Fence	ft	310,754.00	272,617.00	497,036.90	244,261.80	1,324,669.70
Field Border	ft	0.00	2,000.00	34,642.00	33,200.00	69,842.00
Filter Strip	ac	452.00	602.10	104.80	169.50	1,328.40
Firebreak	ft	57,087.00	112,180.00	46,923.00	66,225.40	282,415.40
Forage Harvest Management	ac	1,243.50	626.90	49.60	772.80	2,690.80
Forest Stand Improvement	ac	2,545.70	1,035.10	419.10	832.50	4,832.40
Grassed Waterway	ac	2.90	8.40	0.00	7.00	18.30
Irrigation Water Management	ac	127.60	0.00	0.00	233.40	361.00
Nutrient Management	ac	2,865.30	4,163.80	2,485.00	4,751.00	14,265.10
Pasture and Hay Planting	ac	89.00	181.30	574.50	101.70	946.50
Pipeline	ft	39,534.00	3,950.00	0.00	5,474.00	48,958.00
Prescribed Grazing	ac	5,615.80	18,339.10	8,544.20	4,323.10	36,822.20
Riparian Forest Buffers	ac	2,188.50	39,825.90	4,019.00	8,021.50	54,054.90
Upland Wildlife Habitat Management.	ac	32,139.40	39,825.90	32,671.10	48,038.00	152,674.40
Watering Facility	no	35.00	0.00	3.00	3.00	41.00
Wetland Wildlife Habitat Management.	ac	69,592.10	79,622.60	94,574.80	131,086.60	374,876.10

1.3 Statutory Requirements

Table 1.3.1 summarizes the required changes for the 2008 Farm Bill.

Table 1.3.1 WRP Summary of Issues (NRCS PRS data 2009)

WETLANDS RESERVE PROGRAM — SUMMARY OF ISSUES
Mandatory Items
1. Section 2202 of the Food, Conservation, and Energy Act of 2008 (2008 Act) amended Section 1237(b) of the 1985 Act to add a new enrollment method for tribal lands through 30-year contracts or restoration cost-share agreements.
2. Section 2203 of the 2008 Act amended Section 1237(c) of the 1985 Act to expand land eligibility under WRP to cropland or grassland that was used for agricultural production prior to flooding from the natural overflow of a closed basin lake or pothole, as determined by the Secretary, together (where practicable) with the adjacent land that is functionally dependent on the cropland or grassland.
3. Section 2203 of the 2008 Act amended the eligibility criteria to require that an easement cannot be created on land that changed ownership within the previous 7-year period. Previously, the ownership requirement was for 12 months.
4. Section 2204 of the 2008 Act amended Section 1237A of the 1985 Act to require prohibiting the spraying or mowing of land enrolled in the program, unless necessary, to meet habitat needs of specific wildlife species.
5. Section 2205 of the 2008 Act amended Section 1237A(f) of the 1985 Act to require that easement compensation be based upon the lowest of three values: 1) the fair market value of the land, as determined by the Secretary, using the Uniform Standards of Professional Appraisal Practices or an area-wide market analysis or survey, 2) the geographic cap, or 3) the landowner offer. This provision was effective upon enactment, but changes are needed to conform regulatory language with statute. Section 2205 of the 2008 Act also amended Section 1237A(f)(4) to require a yearly payment limitation for restoration cost-share agreements.
6. Section 2207 of the 2008 Act identified maintenance activities specifically as eligible for cost-share assistance.
7. Section 2208 of the 2008 Act clarified that the $50,000 yearly restoration cost-share payment limitation applies to any person or legal entity. Additionally, Section 2208 extended the existing waiver of the $50,000 yearly payment limitation to 30-year contracts, as well as to payments related to permanent easements and 30-year easements.
8. Section 2201 of the 2008 Act amended Section 1237(a) to limit eligible land to private or tribal land. Section 2203 of the 2008 Act amended Section 1237(c) to insert private and tribal before land in reference to eligible land.

2.0 NEED FOR ACTION

The proposed Federal action being considered by NRCS is the promulgation of revised regulations to implement changes in WRP that have been mandated by the 2008 Act. NRCS has prepared this Programmatic Environmental Assessment (EA) in order to evaluate at a broad national scale the indirect and cumulative effects of the conservation practices, and to use this analysis as a means for site-specific implementation of plans that tier to this analysis. As the scope of the proposed action is for a national program, the analysis herein is referred to as a Programmatic EA and evaluates the potential environmental impacts at a broad program scale. NRCS is utilizing this Programmatic EA to assist the Agency in determining whether promulgation of the proposed rule and implementation of WRP conservation practices will significantly affect the quality of the human environment, such that NRCS must prepare a programmatic Environmental Impact Statement (EIS). In accordance with the Council on Environmental Quality (CEQ) regulations at 40 CFR Part 1508.9, this Programmatic EA is "a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact." In accordance with NRCS regulations that implement the National Environmental Policy Act (NEPA) (7 CFR Part 650.4(b)(2), this Programmatic EA contains the following information:

- A brief discussion of the need for action;
- Alternatives;
- A discussion of the anticipated environmental impacts; and
- A list of agencies and persons consulted.

Actions that may be taken at NRCS State and local levels to further implement WRP will be able to tier to, or incorporate by reference, the general and broad scale analysis from this National Programmatic EA into more site-specific level analyses.

NRCS regulations that implement NEPA (7 CFR Part 650) require a site-specific Environmental Evaluation (EE) to be performed for all NRCS technical and financial assistance for the development of conservation plans with land users. The EE identifies relevant resource concerns and alternatives, evaluates potential impacts, and determines needed mitigation for soil, water, plant, animal, and human resources that may exist on the site. The EE also determines if protected resources occur on the property, and if those resources have the potential to be affected by conservation plan practices. NRCS guidance on the site-specific EE process and definitions of protected resources can be found in the NRCS National Environmental Compliance Handbook (NRCS 2006).
Any subsequent analyses that are prepared to implement WRP at the NRCS State or local level will be meeting the NEPA's intent by focusing on the issues/concerns pertinent to that site-specific action.

3.0 ALTERNATIVES

3.1 Alternative Scoping and Public Involvement

USDA leadership traveled the country in 2005 to hear the opinions of producers and other stakeholders about future farm policy, including WRP. Many people participated in the 52 Farm Bill Forums held throughout the United States, while others submitted comments through the

NRCS Web site and through the mail. All totaled, USDA received more than 4,000 comments throughout this process.

Following is a summary of comments received and considered in the formulation of WRP program alternatives:

- Many commenters supported a fully funded WRP, and many would like to see it expanded even further to preserve the Nation's wetlands.
- Some commenters were concerned with the idea of a permanent land retirement program, as it would reduce the amount of land they could use for other purposes.
- Some commenters stated that the additional income received from WRP allows some struggling farmers and ranchers to stay in business.
- Some see a strong Conservation Title in the 2007 Farm Bill as an opportunity to shift away from the standard of plowing and sowing everywhere to a policy of farming the best land, while conserving the rest in programs such as WRP.
- Several noted that although enrolling land in WRP easements has achieved some success, the overall feeling is that wetlands are still being lost to production.
- Several California commenters stated that WRP needs to be reformed so that "fair market value" paid for easements are not limited to "fair agricultural market value."
- Not only can we not afford to lose any more wetlands to production and development, but also we have to gain back some of those areas for improved soil and water quality.

Detailed Suggestions Expressed

- Recommend that WRP and CRP acreage be considered as working lands.
- Revise the WRP to ensure better long-term effects.
- Better ensure long-term protection of wetlands.

3.2 Alternative 1—No Action

The current or future program incentives through WRP would not be available to participants to implement conservation practices to restore wetland functions and services.

3.3 Alternative 2—Implementation of 2008 WRP Requirements

This alternative involves implementing the WRP under the Interim Final Rule developed by NRCS and according to the statutory requirements that Congress has placed on the program. Many of the statutory requirements are described in Section 1.2 of this document. NRCS will promulgate the Interim Final Rule at the national level to ensure consistency of program implementation across the Nation. However, implementation of WRP will occur at the State and local levels. Decisions regarding the ranking of applications, contract and easement payments, local priorities, and delegations of select duties will be made at the State level.

The primary vehicle to develop wetlands through WRP is to employ conservation practice standards. The three "primary" used are **Wetland Restoration** (657), **Wetland Enhancement** (659), and **Wetland Creation** (678). Each of these standards includes vegetation in the "Definition," "Purpose," and "Criteria" sections, which require specific actions. Vegetation is also included in the "Consideration" section; however, action is not necessary for items listed in this section. Using FY 2007 "Applied" data, the following data supports the application of the vegetative component in WRP:

- Wetland Restoration (657) – 109,512 acres
- Wetland Enhancement (659) – 37,460 acres
- Wetland Creation – 2352 acres
- FY 07 Total Restored, Enhanced, or Created Wetlands – 149,384 acres

All WRP contracts and easements will be accompanied by a conservation plan that will include a grazing management plan for individual enrollees. Conservation practices implemented as a result of restoration agreements, as appropriate, will be planned, evaluated, and implemented for each site as a result of field conservationist's application of NRCS conservation planning process, environmental evaluation, and adherence to the applicable conservation practice standards and specifications. Program incentives would continue to be provided through 2012 to restore degraded wetlands up to a maximum of approximately 3 million acres.

Table 3.3.1 provides a side-by-side comparison of the previous legislation and the proposed 2008 requirements.

Table 3.3.1 WRP Comparison

Previous Legislation	2008 Farm Bill
Capped WRP area at 2.275 million acres. Through FY 2007, 1.947 million acres were enrolled.	Raises WRP area cap to 3.041 million acres through FY 2012.
Wetlands could be restored through permanent easements, 30-year easements, restoration cost-share agreements, or any combination of these options. Easement payments were based on agricultural value of land prior to 2005. Subsequently, they have been based on market value of land.	Retains provisions. Adds 30-year contract for Indian Tribes. Prohibits creation of an easement on land where ownership has changed during previous 7 years with certain exceptions.
Acreage limitations required total WRP and CRP acreage not to exceed 25 percent of county's cropland acreage and no more than 10 percent of the county's cropland acreage may be enrolled in an easement through WRP and CRP.	Retains but removes easements enrolled in CRP easements from the 10 percent of county's cropland acreage limitation.
Eligibility included farmed wetlands or land that was previously converted from wetland to farmland, and buffer acreage adjacent to wetlands. Lands converted from wetland to agricultural production after December 23, 1985, were not eligible for WRP enrollment.	Expands eligible land in WRP to include cropland or grassland that was used for agricultural production prior to flooding from natural overflow of closed basin lake or pothole.
The Secretary determined acceptability of easement offers based on: • extent to which purposes of easement program would be achieved; • productivity of the land; and • on-farm and off-farm environmental threats of using land for agricultural production.	In addition, when evaluating landowner offers, the Secretary may consider: • environmental benefits; • cost-effectiveness with goal of maximizing benefits relative to costs; and • whether landowner offers to contribute financially to cost of easement. Consideration to be given to likelihood of success of easement, offsite environmental benefits, and damages avoided by wetland restoration.
For easements, compensation was not to exceed fair market value of land less than fair market value encumbered by easement. Compensation could be provided in not less than 5, nor more than 30 annual payments of equal or unequal size, as agreed to by the owner and the Secretary.	Easement payments are not to exceed lowest of: • the fair market value of the land, as determined by the Secretary, using the Uniform Standards of Professional Appraisal Practices or an area-wide market analysis or survey; • geographical cap, as determined by the Secretary; and • offer made by landowner. Easements greater than $500,000 are to be paid in 5 to 30 annual installments, unless the Secretary grants a waiver allowing lump-sum payment to further purposes of the program. Easements of less than $500,000 will continue to be paid in 1 to 30 installments. Limits total payments on restoration cost-share agreement enrollments to $50,000 annually to an individual or legal entity, directly or indirectly.

Previous Legislation	2008 Farm Bill
No similar provision.	Creates Wetland Reserve Enhancement Program (WREP) that allows States (including political subdivision or agency of State), nongovernmental organizations, or Indian Tribes to partner with USDA in selection and funding of contracts, as long as selected contracts meet purposes of WRP. WREP includes pilot program that allows landowners to retain grazing rights when consistent with long term wetland enhancement and protection goals.
No similar provision.	Requires the Secretary to submit a report no later than January 1, 2010, that evaluates implications of long term nature of easements on USDA resources. The report should include data on: • number and location of easements; • assessment of impacts that oversight of agreements has on resources, including technical assistance; • assessment of uses and values of agreements with partner organizations; and • any other information relevant to program costs and impacts.

Implementation of all conservation practices applied through the WRP are planned, evaluated, and implemented as a result of field conservationist's application of the NRCS planning process, EE, and adherence to the applicable conservation practice standards and specifications.

Conservation planning is a natural resource problemsolving and management process. The process integrates economic, social (including cultural resources), and ecological considerations to meet private and public needs. This approach, which emphasizes desired future conditions, helps improve natural resource management, minimize conflict, and address problems and opportunities. Conservation planning deals with complete systems of conservation practices, rather than just parts of systems. The expected physical effects of conservation systems and practices are assessed in the context of ecological, economic, and social considerations as documented locally in the Field Office Technical Guide (FOTG). The expected impacts of those effects on natural resource quality, economic needs, and social objectives are then used to help develop and evaluate management alternatives.

As a concurrent part of the planning process, NRCS conducts an onsite EE in which the potential long- and short-term impacts of an action on people, their physical or social surroundings, and nature are evaluated and alternative actions explored.

Alternative actions in the form of individual and groups of conservation practices are formulated to address resource concerns and take advantage of environmental opportunities. Each conservation practice consists of a conservation practice standard which prescribes the minimum materials and workmanship required, and a specification which prescribes how the practice is to be specifically installed.

The planning, EE, and standard and specification for each conservation practice must be satisfied before NRCS will provide Federal financial assistance under the program.

4.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

4.1 Scope of Analysis

NRCS held 52 public meetings throughout the United States prior to the passage of the 2008 Farm Bill. The comments provided on the programs and legislation for the 2008 Farm Bill has helped the Agency focus on the public's concerns and issues. Consequently, NRCS has been able to use these public meetings to identify "what are and what are not the real issues" to be analyzed in this Programmatic EA (1500.5(d)). The issues raised by the public have helped NRCS fulfill one of NEPA's goals, which is to have environmental analyses evaluate "environmental issues deserving of study (and to) deemphasize insignificant issues," thereby "making the NEPA process more useful to decisionmakers and the public" (1500.4(g) and 1500.2(B)).

Listed below are the resource concerns identified by the public and NRCS that were determined to be relevant to the WRP and analyzed in this Programmatic EA:

- Soil (erosion)—streambank, shoreline, and (condition) —subsidence;
- Water (quality of surface waters)—nutrients, suspended sediment, and turbidity;
- Air (quality)—excessive greenhouse gas ($C0_2$);
- Plant (condition)—declining species and species of concern, noxious, and invasive species;
- Animal (fish and wildlife)—food, cover, water, habitat fragmentation, population imbalance, declining species, and species of concern; and
- Human resources—economic, social, and cultural.

The complete list of NRCS soil, water, air, plants, and human (SWAPA+H) national resource concerns considered for analysis can be found at: ftp://ftp-fc.sc.egov.usda.gov/NHQ/ecs/CPPE/cppe-spreadsheet/updated-version/CPPE_National.xls.

Additionally, environmental issues identified in NRCS regulations (7CFR § 650), environmental laws, and Executive Orders are included in the analysis as follows:

- Clean water
- Flood plain management
- Riparian areas
- Wetlands
- Wild and scenic rivers
- Endangered and threatened species
- Natural areas
- Riparian areas
- Essential fish habitat

- Migratory birds
- Cultural resources
- Environmental justice

The Programatic EA focuses on the anticipated impacts of restoring wetland function and services, as is the intended purpose of the program and has the potential for environmental benefits. In the course of implementing the program, there are almost always indirect impacts and/or unintended consequences to other nontargeted resources, i.e., soil, water, air, and human resources.

To identify the direct, indirect, and cumulative impacts of conservation practices, NRCS developed Network Effects Diagrams (diagrams) depicting the possible natural resource effects that typically result from the application of conservation practices. Each of the Network Effects Diagrams first identifies the conditions under which the practice is applied. This includes identification of the predominating land use and the resource concerns that trigger use of the practice. The diagrams then identify the practice used to address the resource concerns. Following identification of the practice, there is a description of the physical activities that are carried out to implement the practice. From there, the diagrams depict the occurrence of the direct, indirect, and cumulative effects of the practice. Effects are qualified with a "+" or a "-" which denotes an increase ("+") or decrease ("-") in the effect. Pluses and minuses do not equate to good and bad or positive and negative. Only the general effects that are considered the most important ones from a national perspective are illustrated. Network Effects Diagrams for all NRCS conservation practices, including a photo and summary description about how each of these practices is intended to be used and the general effects of using the practice, can be found at: http://www.nrcs.usda.gov/programs/Env_Assess/index.html.

4.2 Impacts to Soil Resources

The soils included in the scope of this analysis are hydric soils as defined by the National Technical Committee for Hydric Soils which have been drained to the extent that agricultural production is made possible. The effect of drainage is to either artificially lower the local water table causing internal saturation (endosaturation) to the bottom of a crop root zone, or to divert surface water supplied from surface runoff or stream flooding, eliminating ponding (episaturation). Also included are the soil resources on adjacent lands, which are non-hydric. The areas of hydric soils and adjacent non-hydric soil areas are currently managed as cropland, pasture/rangeland, or riparian area. The resource concerns applicable to these soils are Soil Erosion - Sheet and Rill (limited to adjacent non-wetland areas), Soil Condition - Contaminants - Commercial Fertilizer, Soil Condition - Contaminants - Residual Pesticides, and Soil Condition - Subsidence.

4.2.1 Benchmark Conditions

Soil Erosion – Sheet and Rill is largely limited to those non-wetland adjacent lands which are hydrologically and ecologically connected to former wetlands or wetlands altered by drainage. These adjacent lands are in agricultural production, mostly cropland. Sheet and rill erosion generally is occurring at rates (T) which are in excess of the soils ability to maintain its original thickness of topsoil. The soils ability to maintain high levels of production for agricultural crops,

native vegetation, and wildlife cover is decreasing. Also, the soils ability to absorb rainfall, recharge groundwater, and slow the delivery of floodwater is decreasing. The soil material containing most of the originally sequestered organic carbon is being detached. Soil volume detached by sheet and rill erosion is deposited down slope causing damage due to siltation of other wetland and non-wetland areas. It also contributes to the loss of conveyance of streams and water courses, contributing to downstream flood damages. Land areas in Pasture/Range and Riparian areas are generally not experiencing sheet and rill erosion.

Soil Condition – Contaminants – Commercial Fertilizer is a resource concern on wetland and adjacent non-wetland soils managed as cropland. These soils commonly experience a build-up of nitrogen, phosphorous, potassium, heavy metals, and other elements applied to crops grown on these areas at rates in excess of the crop nutrient utilization rates. Also, water soluble nutrients are removed from the application areas by leaching into local groundwater, or by surface runoff. Finally, nutrients such as phosphorous, which attach to soil particles, are moved by soil erosion. Former wetland soils can no longer serve as sinks for mineral nutrients, or cycle nitrogen by anaerobic decomposition. In addition, loss of organic carbon due to mineralization decreases the soils ability to "tie up" various nutrients. Land areas in Pasture/Range and Riparian areas are generally not experiencing a build up of excess nutrients.

Soil Condition – Contaminants – Residual Pesticides is a resource concern on wetland and adjacent non-wetland soils currently utilized as cropland. These soils commonly experience a build up of pesticides used to control weeds, insects, and soil pathogens. Water soluble pesticides are removed from the application areas by leaching into local groundwater, or by surface runoff. Pesticides which readily attach to soil particles are moved by soil erosion. Pesticides not removed by water or soil erosion can build up to harmful levels. Former wetland soils can no longer serve as sinks for pesticides, or cycle them by anaerobic decomposition. Loss of soil organic carbon due to mineralization decreases the soils ability to "tie up" pesticides. Land areas in Pasture/Range and Riparian areas are generally not experiencing a build up of excess residual pesticides.

Soil Condition – Subsidence is a resource concern on areas of organic soils, or soils with a significant organic component. These areas suffer subsidence when the soil matrix is converted from an anaerobic to aerobic state by drainage. Once exposed to atmospheric oxygen, the organic carbon readily combines to form carbon dioxide. The loss of volume causes the land area to sink or subside. Subsidence causes a loss of agricultural productivity, as well as a loss of the areas original ability to provide wetland functions and values. Only those soils which are organic or have a large organic carbon component experience subsidence, and figures for the percentage of these areas included in the scope are unknown.

Prime and Unique Farmlands occur on hydric soils which are drained for agricultural production. However, continued drainage activities can contribute to a degradation of the soil resource on prime and unique farmland due to the previously mentioned resource concerns. Land designated as Prime Farmland due to drainage is suffering subsidence (if organic) and buildups of contaminants.

4.2.2 Alternative 1: No Action- WRP Not Funded

No positive change from the benchmark conditions will occur on approximately one million additional acres of former wetlands. Continued production on marginal lands will continue to degrade the soil resource.

Soil Erosion – Sheet and Rill Erosion will continue to remove topsoil mainly from non-wetland areas managed as cropland on areas adjacent to hydric soil areas. Soil erosion occurring at rates greater than the topsoil formation will cause long term and irreversible damages to soil quality.

Soil Condition – Contaminants – Commercial Fertilizer will continue to be a resource concern on hydric soil areas and adjacent non-hydric soil areas which are managed as cropland.

Soil Condition – Contaminants – Residual Pesticides will continue to be a resource concern on hydric soil areas and adjacent non-hydric soil areas which are managed as cropland.

Soil Condition – Subsidence will continue on organic soil areas in cropland until the level of subsidence reaches the point where artificial drainage is no longer possible. These areas, when abandoned, are permanently altered, and the hydrologic regime is changed from a moist soil condition to an open water regime. The damage to the resource will be permanent.

4.2.3 Alternative 2: WRP is Funded, Increasing the Total Enrollment to 3,041,200 Acres of Restored and Enhanced Wetlands

The additional enrollment of approximately one million acres of Prior Converted (PC) wetland, Farmed Wetlands (FW), and Farmed Wetland Pasture (FWP) into the WRP, along with the addition of adjacent non-wetland areas allowed by the program, will benefit soil resources. Areas of hydric soil and non-hydric adjacent lands are converted from cropland to wetland.

Soil Erosion – Sheet and Rill Erosion is controlled on non-hydric soils adjacent to hydric soil areas. The land use of these areas is converted from cropland to a cover of native grasses and/or trees.

Soil Condition – Contaminants - Commercial Fertilizer ceases to be a resource concern on both hydric soil areas as well as non-hydric adjacent lands. Cropland areas are converted to wetland vegetative plant communities and to a cover of non-wetland native grasses and/or trees. These areas will no longer receive commercial fertilizers.

Soil Condition – Contaminants - Residual Pesticides cease to be a resource concern on both hydric soil areas as well as non-hydric adjacent lands. Cropland areas are converted to wetland vegetative plant communities and to a cover of non-wetland grasses and/or trees. These areas will no longer receive pesticides, except for occasional treatments during the wetland establishment period to control invasive species.

Primary means to develop wetlands through WRP is to employ conservation practice standards. The three "primary" conservation practices used are **Wetland Restoration** (657), **Wetland Enhancement** (659), and **Wetland Creation** (678). Each of these standards includes the establishment of hydric soil conditions in the "Definition," "Purpose," "Criteria," and/or "Consideration" sections. However, soil resource concerns other than establishment of hydric soil conditions are addressed by other conservation practice standards commonly utilized in WRP.

Only the resource concern *Soil Condition - Subsidence* is directly addressed by the three primary wetland conservation practice standards, and only as applied on organic soils. Most of these soils occur in the Upper Midwest and Florida, with smaller components spread throughout the remainder of the country. The total areas already restored by WRP in Florida, Illinois, Indiana, Michigan, Minnesota, New York, Ohio, and Wisconsin amount to 499,122 acres. This accounts for 26.0 percent of the 1,921,144 acres restored by WRP to date. Assuming that 50 percent of the restored areas in these States are on organic soils, and applying these proportions to the potential one million acres restored by the 2008 Farm Bill authorization, there are 260,000 acres of soils subject to subsidence included in the scope of this assessment. Subsidence occurs on soils utilized for all land uses. However, most drainage is performed for the purpose of using land as *cropland.*

In FY 2007, the following acres were subject to improvement in the soil resource concerns:

- Wetland Restoration (657) – 109,512 acres
- Wetland Creation(658) – 2352 acres
- Wetland Enhancement (659) – 37,460 acres
- FY 2007 Total Restored, Enhanced, or Created Wetlands – 149,384 acres

Examples of activities applied (installed) in WRP for FY 2007 demonstrating benefits to soil resource concerns:

Conservation Cover	9,608 Acres
Cover Crop	214 Acres
Filter Strip	170 Acres
Range Planting	1,161 Acres
Riparian Forest Buffer	8,022 Acres
Terrace	4,075 Feet

Prime farmland that has been designated due to drainage modifications would loose the ability to meet the designation criteria as natural hydrology is restored. Although the designation would be lost, the ability to restore the drainage and return the land to prime condition would not.

4.3 Impacts to Water Resources

Water in wetland systems creates the anaerobic soil conditions required for hydric soils, carries suspended and dissolved solids into and through wetlands, supports the growth and maintenance of hydrophytic vegetation, and is used as habitat by aquatic organisms, including fish, herptivores, and waterfowl.

4.3.1 Benchmark Conditions

Water Quality - Excessive Suspended Sediment and Turbidity in Surface Water - is a resource concern produced on former wetland areas which are being managed as cropland. In addition, adjacent non-wetland areas which are eligible for the proposed WRP produce excessive suspended sediment and turbidity when managed as cropland. The source of this sediment is mainly due to sheet and rill erosion on eligible non-wetland areas adjacent to former wetlands. Water delivered to downstream streams and lakes deposits sediment in channels and water bodies, causing a loss of conveyance capacity, and requiring expensive removal. Treatment for municipal water supplies is more costly.

Drained areas can no longer store and cycle suspended sediment and turbidity caused by mineral and organic matter in the water column. This sediment and turbidity is entrained in the water column in areas other than the former wetland or adjacent areas. Water with its quality degraded by this resource concern is passing untreated through former wetlands.

Water Quality – Excessive Nutrients and Organics in Surface Water - is a resource concern produced on former wetland areas which are being managed as cropland, as well as adjacent non-wetland areas which are eligible for the proposed WRP. The source of these contaminants is pollution from natural or human sources. In addition, drained areas can no longer store and cycle these contaminants. Water degraded by these contaminants is passing through drained wetland areas untreated. Water delivered downstream to streams and lakes deposits sediment in channels and water bodies, causing a loss of conveyance capacity, and requiring expensive removal; however, treatment for municipal water supplies is more costly.

Water Quantity – Excessive Runoff, Flooding, or Ponding - is a resource concern caused by the loss of floodwater attenuation when wetlands are drained. Water is no longer stored as depression storage in surface depressions or in the soil as soil water storage. Drained wetland areas will continue to pass water from upland runoff sources unimpeded to downstream stream channels.

Water Quantity – Groundwater Recharge - is a resource concern caused by wetland drainage on those former wetland areas which formerly had ponded water and transferred water into the local groundwater table through seepage. Drainage has reduced the detention time of water on the surface and provides for less recharge of groundwater aquifers. Groundwater aquifers continue to suffer from limited supply.

4.3.2 Alternative 1: No Action - WRP Not Funded

No beneficial change from the benchmark conditions will occur on approximately one million additional acres of former wetlands. Continued production on marginal former wetlands and adjacent uplands will continue to degrade water resources.

Water Quality – Excessive Sediment and Turbidity in Surface Water will continue to be a resource concern for those acres not enrolled in WRP. In addition, downstream receiving waters will continue to degrade because of the lack of sediment storage and cycling capabilities of drained wetlands.

Water Quality – Excessive Nutrients and Organics in Surface Water will continue to be a resource concern on those acres not restored by WRP. Surface runoff originating on drained wetlands, as well as that runoff originating in upland sources which formerly cycled through wetlands, will continue to maintain excess contaminants. These nutrients and organics will continue to cause increased cost of treatment for municipal water supplies. They will also cause degradation to the vegetative plant community in downstream receiving waters in the form of algae blooms, loss of endangered and threatened species, and other adverse effects.

Water Quantity – Excessive Runoff, Flooding, or Ponding will continue to be a resource concern as drained wetlands can no longer detain surface runoff and attenuate flood peaks. Increased downstream flood damages cause a degradation of the local infrastructure as expenditures are shifted from capital improvements to maintenance of roads, bridges, dikes, canals, and other public works.

Water Quantity – Groundwater Recharge will continue to be a resource concern as drained wetlands pass water unimpeded to downstream receiving waters without the residence time required to percolate downward into the local water table. Groundwater sources of irrigation, municipal, and industrial water are diminished, resulting in an economic loss. Receiving streams receive less groundwater to support the base flow needed by fish and other aquatic organisms.

Clean Water Act/Waters of the U.S. – Land currently maintained as wetland will be unaffected by the No Action Alternative. These areas are already protected by the Swampbuster provisions of the 1985 Farm Bill, as well as the requirements of the Clean Water Act (CWA) The proposed WRP will not conflict with the provisions of the CWA. Former wetlands which were drained before the passage of the CWA will continue to suffer a loss of function.

Coastal Zone Management Areas – Areas of the U.S. coast covered by a State Coastal Zone Management Plan will continue to experience degradation due to erosion, nutrients, and pesticides without the benefits of the WRP to mitigate this degradation.

Floodplain Management – The function of floodplains subject to Executive Order 11988 will not be improved if the proposed action is not undertaken. Floodplains will continue to experience higher peak discharges, with consequently higher damages to human infrastructure.

Riparian Areas – Adjacent to former wetlands or subject to delivery of surface or groundwater originating on former wetlands will continue to suffer damage from excess sediment, turbidity, nutrients, pesticides, and peak flood discharges.

Wetlands – Wetlands that have not been altered or drained to the extent that they no longer meet wetland criteria will continue in their current status. Those which have been degraded will not be improved by the proposed action. Wetlands which have been degraded, as well as those which have not, will not have their functions improved through the restoration of adjacent wetlands.

Wild and Scenic Rivers – Streams designated as Wild and Scenic Rivers will continue to suffer loss of function if their stream corridor contains wetlands. The functions lost may include dynamic floodwater storage, nutrient and sediment cycling, and wildlife habitat. Stream corridor wetlands are an integral part of the fluvial system, and the designated rivers are unable to function as Wild and Scenic Rivers without the wetland component.

4.3.3 Alternative 2: WRP is Funded Increasing the Total Enrollment to 3,041,200 Acres of Restored and Enhanced Wetlands

The additional enrollment of approximately one million acres of PC wetland, FW, and FWP into WRP, along with the addition of adjacent non-wetland areas allowed by the program, will benefit water resources. Areas of hydric soil and non-hydric adjacent lands are converted from cropland to wetland.

- *Water Quality – Excessive Suspended Sediment and Turbidity in Surface Water* is treated by the conversion of cropland adjacent areas to native grass or trees, greatly reducing sheet and rill erosion. Restoration of the wetland detention capabilities will cause sediment from non-adjacent sources to deposit and/or cycle through the restored wetland.
- *Water Quality – Excessive Nutrients and Organics in Surface Water* is treated by the restoration of healthy plant and animal communities, as well as anaerobic soil conditions on degraded wetland sites. This re-establishes the cycling of nutrients and organics, or provides a sink for these materials in the wetland. Restored wetlands, particularly those along river flood plains, filter out sediments, chemicals, and nutrients. In addition, the restoration of wetlands on former agricultural fields decreases erosion and the use of pesticides and fertilizers. Research has shown that wetlands trap 50 percent of dissolved phosphate, 70 percent of dissolved nitrates, and 30 - 40 percent of dissolved organic nitrogen, phosphorus, and carbon from farm field runoff each year. The economic value of wetlands along streams and rivers for pollution control is estimated to be $95 per acre per year. Local water quality is also improved by the restoration of riparian cover that can shade streams and reduce thermal pollution. This improves habitat for many species of fish, such as salmon. The proposed Federal action will prevent the development of excess quantities on the degraded wetland site, as well as provide a treatment site for nutrients and organics from an upstream source.
- *Water Quantity – Excessive Runoff, Flooding, or Ponding* will be reduced or eliminated from those areas downstream of degraded wetlands. Restoration will provide increased dynamic floodwater storage, increased vegetative flow resistance, and higher detention capacity, resulting in a reduction in downstream damages to infrastructure and crops.
- *Water Quantity – Groundwater Recharge* will be improved by restoring the ability of degraded wetland areas to store water in surface depressions as well as in soil pores. The storage capacity will be improved by physically altering the wetland surface, or by the

provision of wetland microtopography resulting from the actions of wetland vegetative plant communities. Wetland vegetation will also increase the soil pore storage capacity.

- *Clean Water Act/Waters of the U.S.* – Waters of the U.S. which are not enrolled in the proposed WRP program will not be degraded by the implementation of the proposed Federal action. In general, waters of the U.S. adjacent to former wetlands restored under the proposed Federal action will experience an increase in function as fragmented wetlands are combined into larger tracts. Waters of the U.S. enrolled directly in the proposed Federal action will be restored under the authority of Nationwide Permit No. 27, which allows incidental fills in wetland areas when those fills are consistent with the restoration of the wetlands functions. These areas will see a direct restoration and increase of wetland function.
- *Coastal Zone Management Areas* will experience an increase in wetland function as the management plans utilize the WRP to restore and enhance estuarine fringe wetlands. Offshore fish and wildlife habitat will improve, and coral reefs will regain health as wetlands in the coast areas function to cycle or nutrients and sediment. Wetlands upstream of coastal zones will provide a reduction of sediment, nutrients, and pesticides reaching the coastal zones.
- *Floodplain Management* will be improved with the restoration of riverine wetlands authorized by this action. Downstream flood peak discharges will be reduced.
- *Riparian Areas* will be improved with the restoration of adjacent wetlands authorized by the proposed action. These wetland areas exist in floodplains or on upland areas adjacent to floodplains. Lateral and longitudinal connectivity between the active stream channel and the floodplain will be reestablished. Streambank erosion, with resulting damages both on and off site will be reduced or eliminated.
- *Wetlands,* both partially drained and undrained, will experience an increase in function. Drained wetlands will be restored. Functioning wetlands, both adjacent and non-adjacent, will benefit from the reduction of habitat fragmentation. Upstream wetland restoration will reduce the sediment and nutrient load delivered to existing wetlands.
- *Wild and Scenic River* corridors will improve their function and increase their level of sustainability as wetlands in the corridor floodplain, as well as adjacent uplands are restored or enhanced under the proposed Federal action. The wetlands will take their place in the stream corridor landscape continuum, and provide interactive functions.

The primary means to develop wetlands through WRP is to implement NRCS conservation practice standards. The three "primary" conservation practices used are **Wetland Restoration** (657), **Wetland Enhancement** (659), and **Wetland Creation** (678). Each of these standards includes hydrology in the "Definition," "Purpose," and "Criteria" sections, which require specific actions.

In FY 2007, the following acres were subject to improvement in the water resource concerns:

- Wetland Restoration (657) – 109,512 acres
- Wetland Enhancement (659) – 37,460 acres
- Wetland Creation – 2352 acres
- FY 2007 Total Restored, Enhanced, or Created Wetlands – 149,384 acres

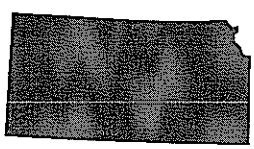
Examples of conservation practices applied through WRP in FY2007 (according to NRCS PRS data, 2008) demonstrating benefits to water resource concerns include:

Channel Bank Vegetation	15 Acres
Channel Stabilization	10,620 Feet
Critical Area Planting	553 Acres
Diversion	4,000 Feet
Filter Strip	170 Acres
Nutrient Management	4,751 Acres
Riparian Forest Buffer	8,022 Acres
Riparian Herbaceous Cover	127 Acres
Streambank and Shoreline Protection	7,614 Feet
Structure for Water Control	475 Each

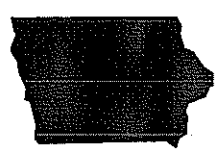
Examples

Wetlands are critical components of the landscape's hydrology since they serve as detention areas for flood waters. As wetlands were drained, downstream flooding increased. Restoring wetlands allows these areas once again to store water and decrease or slow flood flows.

Catastrophic flooding along the Missouri River during the mid 1990s increased interest in expanding floodwater storage. WRP in Missouri has been used to breach levees on 16,000 acres, which has reduced flood heights and decreased downstream flooding. These areas also provide spawning habitat for fish and foraging areas for migratory birds.



A 1,200 acre WRP easement in Neosho County, Kansas provides shallow water wetland habitat and aids in flood protection for the Neosho River Basin. Sixteen wetland cells were constructed that provide 325 acre feet of flood storage capacity and create 370 surface acres of shallow water wetland habitat.



In east-central Iowa, a number of groups and agencies organized after the floods of 1993 to make better use of flood-prone land along the Iowa River. The Iowa River Corridor contains about 50,000 acres, stretching 45 miles. Nearly 100 conservation easements, including WRP and other program easements, are in place on over 12,000 acres. Estimated flood damage savings over the past 10 years is $7.6 million.

4.4 Impacts to Air Resources

4.4.1 Benchmark Conditions

Crop production is practiced on drained, partially drained, or undrained (farmed under natural condition) wetland sites, as well as on adjacent lands eligible for WRP. Tillage reduces soil cover to the extent that it is subject to wind erosion. Certain soils and geographic areas are prone to wind erosion. Drained organic soils are especially susceptible to wind erosion. Wetlands and former wetlands eligible for WRP under Alternative 2 which are in other land uses have little direct effect on the air resource.

4.4.2 Alternative 1: No Action - WRP Not Funded

No beneficial change from the benchmark conditions will occur on approximately one million additional acres of former wetlands. Continued production on marginal lands will continue to degrade the air resource. Particulate Matter (PM) will continue to be a resource concern on those wetland, drained wetland, and eligible adjacent land areas used as cropland in climates and on soils susceptible to wind erosion.

4.4.3 Alternative 2: WRP is Funded Increasing the Total Enrollment to 3,041,200 Acres of Restored and Enhanced Wetlands

The additional enrollment of approximately one million acres of PC wetland, FW, and FWP into the WRP, along with the addition of adjacent non-wetland areas allowed by the program, will benefit air quality. PM as a resource concern will be virtually eliminated with the implementation of wetland restoration activities under WRP. The primary means to develop wetlands through WRP is to employ conservation practice standards. The three "primary" conservation practices used are **Wetland Restoration** (657), **Wetland Enhancement** (659), and **Wetland Creation** (678).

In FY 2007, the following acres were subject to improvement in the air resource concerns:

- Wetland Restoration (657) – 109,512 acres
- Wetland Enhancement (659) – 37,460 acres
- Wetland Creation – 2352 acres
- FY 2007 Total Restored, Enhanced, or Created Wetlands – 149,384 acres

Placing land in permanent cover also reduces air pollution by decreasing wind erosion.
In addition, approximately 600,000 acres of WRP lands support growing trees, which sequester atmospheric carbon. Each acre of growing bottomland hardwood forests will sequester 2,566 pounds of carbon each year, according to R. A. Birdsey in 1996 for American Forests.

All of the individual conservation practice standards which install permanent or temporary cover of vegetation, or improve the management of vegetation, will decrease the potential production of excess airborne particulate matter.

4.5 Impacts to Biological Resources

4.5.1 Benchmark Conditions

Wildlife – Populations exist in both agricultural (crop, pasture, range, riparian) and native systems; however, there is a vast difference in species composition and human based values of the species occurring on each. In agricultural systems, the animal communities are high in invertebrates (common as agricultural "pests" – grasshoppers, aphids, mites, nematodes, grubs, and other crop parasites), and low in vertebrates (generally considered "wildlife"). Considerable dollars are spent yearly in chemicals and tillage to control the invertebrate populations. The margins of agricultural fields do, however, support limited population of game and other wildlife species because of the grain or forage growing on agricultural lands. This use of agricultural production by vertebrates can lower crop yields and total forage potential to producers. In contrast, natural sites provide habitat for an array of native vertebrates, as well as a different assemblage of beneficial invertebrates such as pollinators, butterflies, parasitic wasps, and soil based insects that recycle detritus in the soil profile.

Crop Lands – Crop production is practiced on drained, partially drained, or undrained (farmed under natural condition) wetland sites. Crop yields on partially drained and undrained sites are marginal or fail. Vegetation consists of monocultures of non-native annual commodity crops, possibly in rotation with a cover crop. Depending upon cultivation practices, noxious, invasive, and other problem weed species (mostly non-native) may populate the fields. Crop production areas produce little or no wildlife habitat although some food utilization occurs. Monoculture stands of annual crops limit the diversity of residue on the soil, thus limiting the soil invertebrates and their ability to recycle nutrients and increase soil tilth in both till and no-tillage systems when compared to natural ecosystems. Monoculture crops also limit overall species diversity which reduces potential for overall animal species diversity and does not provide forage habitat for pollinators and other beneficial insects. Crop yields are reduced by feeding of resident wildlife which has fewer food source alternatives. Assemblages of wildlife guilds (waterfowl and neotropical migratory birds) are absent while others (caudate and anuran) will be excluded.

Pasture/Rangeland – Existing vegetation consists of tame (domesticated, non-native) pasture/grasses or other generally non-native vegetation in monocultures or with low species diversity. Forage production is marginal in partially drained or undrained sites. Grazing pressure decreases some species, while increasing others, resulting in lowered species diversity and spread of noxious, invasive, and problem species. Pasture/Rangeland provides more resources for resident wildlife than annual commodity crop production; however, the potential for wildlife use is lower than for natural areas. Ground nesting birds suffer nest losses from trampling by domestic animals. Situations occur where grazing is a preferred method of controlling unwanted woody vegetation and creates soil disturbance for some endangered species habitat. This is particularly true in some mid-Atlantic and Southeastern States where grazing and hoof action on FWP maintains habitat for the endangered bog turtle. However, without proper grazing/stocking rate, these species will be harmed.

Riparian Areas – Limited and sparse vegetation affords little cover for wildlife species. Shade is reduced on the water column leading to thermal pollution. The reach and extent of cold water fishes (trout, salmon) is reduced. Nesting and forage potential for riparian birds is reduced by limited vegetation and the shift of native vegetation to species tolerant of site conditions.

Natural Areas – Agricultural use on lands limit the size and proximity of natural areas to one another. Limits in natural area size in turn limits the types of wildlife species that can occur and increases predation and parasitism (nest parasites). Birds and small mammals risk increase predation while attempting to cross open areas in route between natural areas.

Coral Reefs – The WRP program is not involved, nor affects coral reefs either directly or indirectly.

4.5.2 Alternative 1: No Action- WRP Not Funded

Limited increase in ecological condition from the benchmark conditions will occur on approximately one million additional acres of former wetlands. Crop production on marginal lands will continue to degrade biological resources.

Wildlife – Resident birds, reptiles, amphibians, pollinators, native bees, game species, and other vertebrate and invertebrate species will not be afforded preferred habitats to maintain populations beyond current conditions. Based upon agricultural chemical use and cultivation practices, some species may be harmed. For example, broad spectrum pesticides can kill foraging pollinators, butterflies, predatory wasps, and other beneficial insects including biological control insects. Frogs and salamanders utilizing agricultural areas for foraging can be killed during cultivation events and their food sources are eliminated with pesticide use. Crops which are harvested annually eliminate continual food sources for transient wildlife. Some species do benefit from the residual grain and seed resources left in the field after harvest and forage on the weed seed. In pasture/range situations, forage is provided to resident wildlife and raptors benefit from the enhanced rodent populations; however, their population densities will be reduced when compared to the restoration of native lands.

Endangered and Threatened Species – It is anticipated that there will be no beneficial impact on endangered and threatened species. At risk species will not be able to expand their ranges or support additional numbers of individuals if habitat is not expanded for their use and colonization. For example, Bog Turtles (endangered) in the eastern United States rely on grazing to maintain their habitat; however, with stocking rates and grazing durations not controlled by a WRP contract, adverse affects to this species may occur.

Essential Fish Habitat – Primarily in riparian situations, cultivation to water course margins and/or grazing by livestock allows for sediment inputs. Sedimentation in streams decreases many of the aquatic invertebrates sustaining fishes including trout, salmon, and other game and non-game species. The continued lack of vegetation coverage over water courses leads to thermal pollution which reduces the reach and distribution of cooler water species. It does, however, promote a shift in species tolerant of warmer waters and lowered oxygen concentrations.

Invasive Species – Controlled to an extent by additional pesticide use. Areas adjacent to fields, and in fields with incomplete control, will serve as refuges for the growth, reproduction, and dispersal of invasives to other agricultural lands and natural areas. Populations of invasive plant species will likely show an increase over time. Zebra muscle, carp, and other aquatic invasive and non-native species will not be controlled. Populations will likely increase in number and range.

Migratory Birds/Bald & Golden Eagles – Former wetlands currently under upland and production agricultural use do not support high populations of these species. For example, some migratory waterfowl's (geese) use is limited to forage with no nesting or rearing habitat. Other migratory birds (ducks) use these areas sparingly. Eagles may use fields and pasture/range for forage; however, nesting is impossible in habitats lacking trees. Smaller neo-tropical migratory birds are subject to increased predation attempting to cross open areas in route to widely dispersed natural areas.

Riparian Areas – Continue to not provide ecosystem services provided by adequate and proper vegetative composition. Existing vegetation will be stressed by drift of agricultural chemicals, grazing, and soil erosion. Riparian sites will continue to be invaded by invasive species spread from adjacent agricultural lands. Woody vegetation along water courses will exist at less than desirable ecological conditions and will provide limited animal species richness, food sources, and escape cover. Non-native plant species will dominate many sites and provide limited wildlife habitat quality.

Natural Areas – Continue to be limited in extent, and the impact of being isolated from other natural areas results in limited vegetative diversity and a potential decline diversity with invasions of invasive species from adjacent agricultural areas.

4.5.3 Alternative 2: WRP is Funded Increasing the Total Enrollment to 3,041,200 Acres of Restored and Enhanced Wetlands

The additional enrollment of approximately one million acres of PC wetland, FW, and FWP into the WRP, along with the addition of adjacent non-wetland areas allowed by the program, will benefit biological communities. Monoculture stands of row crops are replaced with a diverse assemblage of native plant species adapted to the local geography and climate regime. Biological diversity that depends upon wetlands, declined with the loss of wetlands during the last century. By restoring wetlands and associated uplands, WRP provides habitat for a large array of plants and animals that depend upon wetlands, wetland forests, and grasslands. One-third of all bird species in North America depends upon wetlands during some part of the year. Habitat loss and fragmentation are the most important factors causing the decline of many species. Only through habitat restoration and protection can many of these species be restored to viable populations. WRP provides benefits on a continental scale to migratory birds. Many birds nesting in Canada or on restored WRP sites in North Dakota, New York, and Washington are also wintering on restored WRP sites in Louisiana, Florida, and California. Many species, especially songbirds, spend their winters in Mexico and Central and South America.

Resident Wildlife – Resident birds, reptiles, amphibians, pollinators, native bees, game species, and other vertebrate and invertebrate species will benefit from restoring wetland functions and services and the surrounding uplands which can be included in WRP contracts and easements. Restoration efforts can focus on many of these species through selection or active regeneration of specific vegetation types, or by enhancements to establish preferred habitats to maintain populations beyond current conditions. Reptile and amphibian populations will greatly benefit from WRP. Drained and marginal lands returned to wetlands and surrounding uplands afford habitat for these groups which did not exist prior to the restoration. Although the target objective of WRP is to benefit migratory birds, many species of animals benefit in the restoration of healthy ecosystems.

Endangered and Threatened Species – Benefits to these species are considered in the selection process for WRP enrollment and funding. Restoration and enhancement options in WRP allow for targeting specific species. Specifically, the Louisiana Black Bear, Mississauga Rattlesnake, Bog Turtles, Pallid Sturgeon, Indiana Bat, and Wood Stork have all been targeted. Species can be targeted in restoration activities to augment their recovery.

Essential Fish Habitat – Although not specifically targeted by WRP, a 1:1 ratio of former wetland acres (PC, FW, FWP) to adjacent uplands can be included in contracts and easements. If lands contributing to essential fish habitat are adjacent to the former wetland areas, then these lands can be enrolled into the program and thereby improve essential fish habitat.

Invasive Species – The restoration and enhancement of former wetlands and adjacent areas back into natural vegetation systems controls invasive plant species directly. Conditions conducive to the establishment of invasive plants (i.e., bare soil, fallow fields, and overgrazed pasture/range) will be eliminated after the restoration is complete. Prior to the 2008 Farm Bill, control of noxious and invasive species and other maintenance issues were left to the landowner. Changes to the WRP under the 2008 Farm Bill will allow for cost-assistance for maintenance activities for which the control of invasive plant and animal species can be included.

Migratory Birds/Bald & Golden Eagles – The expressed purpose of WRP is to target "migratory birds and other wetland dependent species." By definition, waterfowl includes an array of diving, dabbling, and wading birds including ducks, geese, swans, shore birds, coots, moorhens, gulls, and herons. Although the vast majority of efforts in WRP contracts target the Family Anatidae (ducks, geese, and swans), most other groups of waterfowl benefit from the habitat provided for the Anatidae. Additional efforts along critical migration routes have been targeted for shorebirds. Bald and Golden eagles benefit indirectly from restoration efforts on WRP easements, especially in some forested wetlands, where tall trees afford nest sites.

Natural Areas – Are enlarged, increased in number, and replace intensively managed areas. WRP allows for some upland to be incorporated into the program. As a result, native lands are reconnected with others allowing for corridors for plant and seed dispersal over time, thus increasing overall species diversity and vegetative community health.

Riparian Areas – Are not directly targeted by WRP; however, riparian areas are included in WRP contracts if the adjacent lands meet the eligibility requirements of Section 1237 (c) of the statute in the same application. Riparian Areas will be reestablished with native vegetation and increase species diversity.

Following are examples of activities applied (installed) in WRP for FY 2007 demonstrating benefits to biological resources:

Control of noxious, invasive, and problem plant species – Several conservation practice standards are used depending upon the vegetation. The two most commonly used are:

- Pest Management (595) – 15,278 acres
- Brush Management (314) – 700 acres

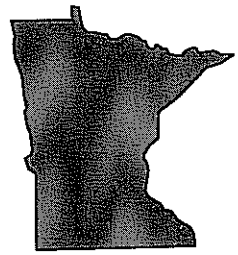
Some practice standards have a vegetation control component, although they are not exclusively used for vegetation:

- Early Successional Habitat Management (647) – 2816 acres
- Field Border (386) – 33,200 feet
- Prescribed Burning (338) – 2,691 acres
- Restoration and Management of Rare and Declining Habitats (643) – 6,694 acres

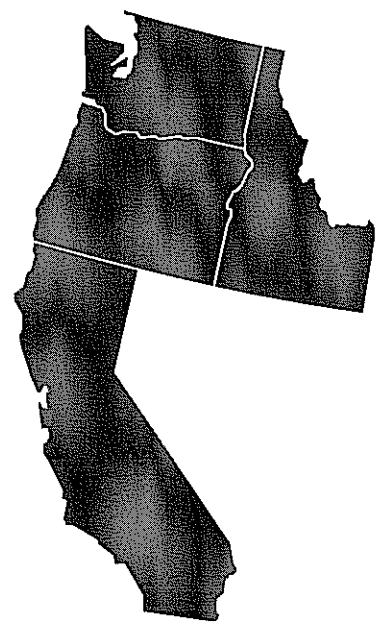
Natural Areas - Increased natural areas will allow propagules to disperse and colonize in these new areas resulting in more viable populations. Through the use of specific practice standards, native vegetation is returned to a site, natural areas are reconnected or expanded, and overall plant species diversity is enhanced (FY 2007 WRP data). Examples are:

- Tree/Shrub Establishment (612) – 30,322 acres
- Prescribed Burning (338) – 2,691 acres
- Forest Stand Improvement (666) – 832 acres

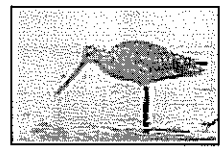
The Glacial Ridge project in Minnesota has placed 10,700 acres under easement to provide nesting habitat for shorebirds and waterfowl and even habitat for moose. This large prairie pothole restoration project supports the largest population of the Western prairie fringe orchid in North America. It also supports habitat along the migratory path of sandhill cranes.

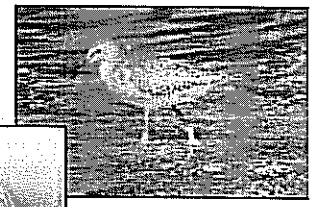


Wetlands are important spawning areas for many species of fish. Wetlands restored in the Pacific Northwest are improving water quality for steelhead and salmon. Levees were breached along the Consumnes River in central California to provide rearing areas for salmon.

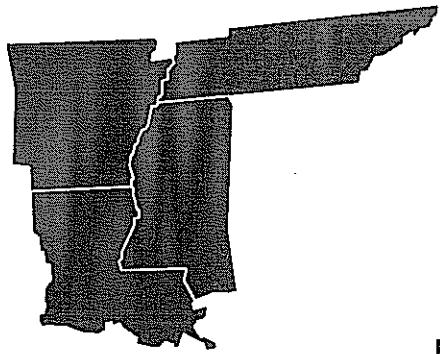


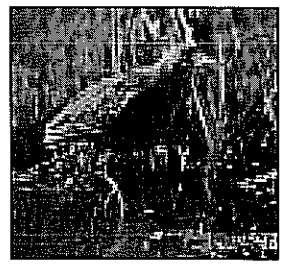
Over a half million waterfowl visited a 7,000-acre restoration site in Raft Creek Bottoms along the White River in Arkansas immediately following restoration. The following spring, 20,000 shorebirds foraged in the mudflats and bald eagles nested in the trees.





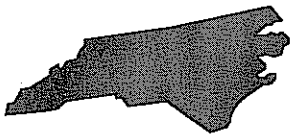
Over 80 percent, 6.8 million acres, of the bottomland hardwood forests of the lower Mississippi Valley have been cleared. These wetland forests provide critical habitat to many species of wildlife including songbirds that have declined due to habitat loss and fragmentation. WRP is restoring approximately 500,000 acres of bottomland hardwoods that will eventually provide important nesting habitat to species dependent upon mature forests. However, during the interim, species depending upon open areas and shrub lands will benefit.

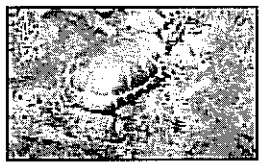




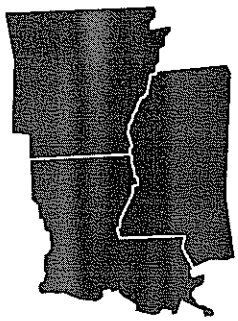
Endangered and Threatened Species

The bog turtle, the second smallest turtle in the world, was listed as a threatened species in 1997 because of habitat loss and fragmentation. A landowner in North Carolina is using WRP to restore and protect habitat for this species.





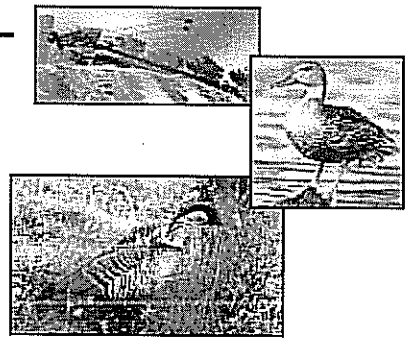
In Phillips County, Arkansas, landowners have enrolled 3,500 acres into WRP that provide or will provide habitat for the Louisiana Black Bear. These acres are filling in fragmented areas next to the White River National Wildlife Refuge in the east central part of the State. Louisiana, Mississippi, and Texas are also restoring and protecting habitat for this threatened species.



Louisiana enrolled more than 232 contracts on 81,674 acres within the Louisiana black bear habitat. Approximately 57,800 acres have been planted to bottomland hardwood tree species.

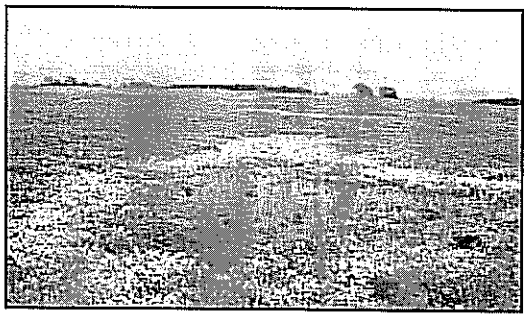
(above) standing in the WRP tract where the bears were born, USFWS biologist, Shauna Ginger holds the two cubs (photo by James Cummins, Wildlife Mississippi)

In Hawaii, wetland restoration projects have been used to improve habitat for endangered species such as the Nene Goose and Koloa Duck, as well as the Hawaiian damselfly.

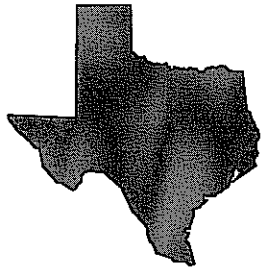


Puerto Rico's Cabo Rojo salt flats that are being protected through WRP are critical to many species of wildlife in the Caribbean. This area provides habitat for piping plovers, peregrine falcons, brown pelicans, manatees, and several species of sea turtles.

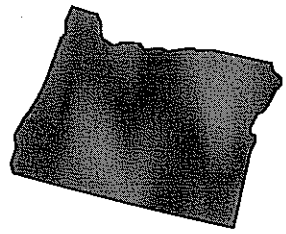
Upland areas adjacent to wetland projects in southern California are being restored to provide habitat for the endangered San Joaquin kit fox, Tipton kangaroo rat, and blunt-nosed leopard lizard. Vernal pools in California, which have rapidly disappeared due to urban growth, are being restored and protected to provide habitat for endangered tadpole shrimp and fairy shrimp.



When large wetland complexes are restored, many species benefit, including nonwetland species. For example, uplands that provide important buffers for wetlands in south Texas are protecting scrub thorn forests which are important to ocelots.



In Oregon, deep pools were included on a restoration site to ensure the survival of the endangered Oregon chub. On the same site, logs were placed to provide basking sites for the Pacific pond turtle, which has experienced a significant decline in population.



4.6 Impacts Human Resources

4.6.1 Benchmark Conditions

Lands enrolled in WRP typically occur on former wetlands which have been completely or partially drained or farmed under natural conditions. Prior to conversion, these wetlands provided great societal benefit. Once converted to agriculture, these lands currently provide great societal benefit. On May 24, 1977, President Jimmy Carter issued Executive Order 11990 on the Protection of Wetlands. Successive Presidents have supported this order, and in the case of President Ronald Regan, expanded the concept to consider "no net loss of wetlands." Urged by the American Public, these Presidential decisions placed a high value on wetlands, and by doing so, placed greater human value on wetlands than on agricultural production on some lands.

Lands in cultivation on former wetlands are in crop or pasture/range condition. Production on these lands (unless completely converted) are generally not as productive as uplands, and are more susceptible to soil erosion, possible ground or surface water contamination from agricultural chemicals, do not support native stands of vegetation, and generate little wildlife benefit compared to the natural condition. Cultural resources are not protected from tillage, scavenging, and the removal of water (i.e. anaerobic conditions) which can lead to rapid decomposition of cultural artifacts. Scenic beauty and other culturally derived aesthetic values vary from natural conditions.

The cultural environment of those lands that have the potential of enrollment in WRP contains both prehistoric and historic districts, sites, buildings, structures, landscapes, and objects. These places and objects reflect a full range of human activities occurring within the United States and document a complex record of history and heritage inclusive from the earliest Americans to today. A known portion of this cultural environment is eligible for inclusion on the National Register of Historic Places. A larger, unknown portion of the cultural environment has not been inventoried or evaluated. It is also unknown to what extent the cultural environment has been impacted by forces such as erosion, agricultural cultivation, grazing, clearing native vegetation, or changes in hydrology. Many important prehistoric and historic resources in this cultural environment have been, and are being systematically looted and destroyed for the heritage resources they contain. In summary, the benchmark condition of the cultural environment is characterized by resources inclusive of a broad range of types and classes important to America's history and heritage that are highly varied in degree of significance and concurrent state of preservation.

4.6.2 Alternative 1: No Action - WRP Not Funded

No beneficial change from the benchmark conditions will occur on approximately one million additional acres of former wetlands. Continued production on marginal lands will continue to erode resources (soil, water, air, plants, animals, and cultural) deemed valuable to society.

Cultural Resources – Water resources and wetlands provided habitat and hunting/fishing opportunities to Native Americans. Settlements were frequently centered in close proximity to these areas. Early European settlers also settled in similar areas for similar reasons. Continued

cultivation and grazing disturbs buried cultural artifacts and allows for scavenging by collectors, while the drainage of formerly inundated areas can create rapid decomposition of artifacts of biological origin by creating aerobic conditions. The cultural environment will continue to be affected by the same on-going environmental actions and agricultural practices previously described. This may cause direct and/or indirect impacts to historic properties. Opportunities to enhance, preserve, and protect this cultural environment would be potentially forgone on one million acres of private and non-Federal lands.

Environmental Justice – The WRP does not target any population group or socioeconomic class. Contracts are entered into voluntarily by landowners and affect only the lands agreed to by the landowners.

Scenic Beauty – Lands currently in agriculture will remain in some form of agricultural production. Continued degradation of cultural resources and aesthetic value derived from natural landscapes will occur.

4.6.3 Alternative 2: WRP is Funded Increasing the Total Enrollment to 3,041,200 Acres of Restored and Enhanced Wetlands

The additional enrollment of approximately one million acres of PC wetland, FW, and FWP into the WRP, along with the addition of adjacent non-wetland areas allowed by the program, will benefit human resources. Examples of activities applied (installed) in WRP for FY 2007 demonstrate human benefits, especially pertaining to scenic beauty. No conservation practice standard relates directly to cultural resources.

- Wetland Restoration (657) – 109,512 acres
- Wetland Enhancement (659) – 37,460 acres
- Wetland Creation – 2352 acres
- FY 07 Total Restored, Enhanced, or Created Wetlands – 149,384 acres

Cultural Resources – Reversion of former wetland back to original condition will preserve existing cultural resources. The anaerobic conditions of wetland soils slows the decomposition of biological artifacts (clothing, wooden tools, human remains) as well as avoiding continued disturbance of non-biological artifacts (pottery, points, grinding tools, etc.). With the eligible enrollment of adjacent uplands, settlement and burial sites will remain undisturbed. Enrolling one million additional acres in WRP has the potential for both beneficial and adverse effects to historic properties (those properties eligible for inclusion on the National Register of Historic Places). These benefits and impacts can be direct, indirect, and cumulative.

It is likely for there to be beneficial indirect effects to historic properties from the conservation planning process and site-specific EE process because some of these important heritage resources should be identified and delineated. The EE and Section 106 review processes should be able to determine the need for consultation with State Historic Preservation Officers (SHPO), Tribes, and Tribal Historic Preservation Officers (THPO) under Section 106 of the National Historic Preservation Act (NHPA) in order to ensure the appropriate measures are taken to address and take into account possible effects to historic properties.

Even though NRCS will consult on a site-specific level for compliance with Section 106 NHPA and the Advisory Council on Historic Preservation (ACHP) implementing regulations, it is probable that in general there are several conservation practices that can result in beneficial effects to National Register properties. For example, returning hydrology features and maintaining saturated or wetland conditions on certain types of archaeological sites that have buried perishable artifacts (cordage, wooden tools, log structures, etc.), and maintaining anaerobic conditions, has shown to be highly beneficial in preservation. Conservation plantings on some types of archaeological sites have reduced soil erosion from both wind and wave actions. Replanting certain types of native vegetation in cultural landscapes has increased opportunities by Native Americans to gather subsistence and medicinal resources, as well as participate in various other traditional cultural activities.

There is the potential for indirect impacts from the application of conservation practices on these private and non-Federal lands. However, these indirect impacts would be addressed (avoided, treated, and mitigated) and dealt with on a case-by-case basis through the Section 106 compliance process for NHPA. NRCS would ensure compliance with the NHPA Section 106 process and associated authorities through the NRCS State offices following the procedures outlined in the ACHP regulations (36 CFR Part 800) or NRCS' alternate procedures (nationwide Programmatic Agreement), if applicable. In these agreements, NRCS is may invite the SHPO's and federally recognized Tribes (or their designated THPOs) to enter into long-term consultation agreements that focus review and consultation in accordance with the requirements stipulated in the nationwide programmatic agreement.

In cases where there are no State-level agreements or tribal consultation protocols for Tribes that have an interest in the WRP project area, NRCS must comply with the provisions of the ACHP Section 106 regulations prior to proceeding to implementation.

There is the likelihood for indirect negative impacts from conservation practices such as any ground disturbing activities. However, it is important to note that the site-specific EE and NHPA Section 106 compliance review process will occur.

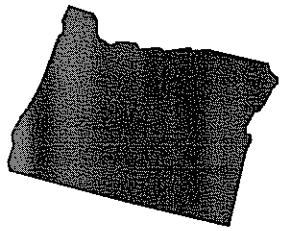
The site-specific EE and Section 106 review and consultation should identify the likely presence or absence of historic properties that need further consideration under NHPA. In such cases, historic preservation professionals who meet the Secretary of Interior's professional qualification standards may need to conduct on-site identification and evaluation studies to determine whether there are historic properties within the area of potential effect. If there are, these same historic preservation professionals must recommend to NRCS whether there will be an adverse effect, and if there is, define the nature of the effect. NRCS must determine whether the undertaking (practice or system) may be moved or modified to avoid effects.

If a historic property is present and would be affected by the proposed practice or system (undertaking), the State Conservationists, SHPOs, American Indian Tribes/THPOs and other consulting parties would consult on the need for project-specific mitigation measures or treatments, including avoidance of adverse effects by slight movement or redesign of the practice or system, if feasible. If there is an adverse effect, NRCS must submit documentation to the ACHP (including comments from all consulting parties and a proposed agreed upon

Memorandum of Agreement) that outlines the steps that will be taken to minimize or mitigate the adverse effects and afford the Counsel an opportunity to participate in resolution of the adverse effects.

Examples:

In Oregon, the Bulrushes are culturally important to several American Indian Tribes in Washington.



Confederated Tribes of the Umatilla are working with NRCS and others to restore wetland plants that have traditional cultural value. In addition, the United Indian Health Service in northern California is using a restored site to grow wetland plants for their medicinal value to American Indians.

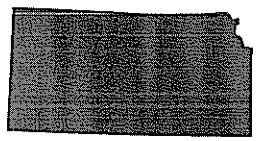
Environmental Justice – WRP does not target (positively or negatively) any population group or socioeconomic class. Contracts are entered into voluntarily by landowners and affect only the lands agreed to by the landowners. In the 2008 Farm Bill, a 30-year contract option is established for Tribes, similar to individuals not on tribal lands. Also, this amendment establishes a WREP, where the Secretary of Agriculture can enter into agreements with Tribes (and others) for special wetland programs including a "reserve rights pilot program for grazing."

Scenic Beauty – Societal opinion reflected through Executive Orders and subsequent laws has placed a high value on natural landscapes, vegetation, and wildlife. The continued enrollment and restoration of former wetlands and adjacent lands into WRP will create aesthetically pleasing natural conditions.

Recreation and Education – Wetlands provide more than ecological functions and benefits to fish and wildlife. A growing human population has a greater need for recreation and opportunities to enjoy natural settings. Wetlands also serve as outdoor classrooms where ecological principles can be taught and knowledge gained. Restored wetlands provide recreational hunting opportunities for landowners and many offer free access hunting on their land. Bird watching and nature viewing are two of the most rapidly growing outdoor activities. Many State agencies have realized the potential for developing non-consumptive recreational values of WRP restorations and are working with NRCS to develop observation owers and parking lots near restored areas.

Examples

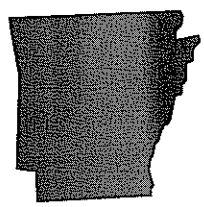
A WRP project in Lyon County, Kansas contains a large single tract of prairie cordgrass. It is a prime example of native grass lowlands. Emporia State University has used this for student and faculty studies.



The Sacramento, California chapter of the Audubon Society uses the Consumnes River restoration project every other Saturday for bird watching tours.

Restoration projects throughout the country are being used as outdoor classrooms to teach biology and conservation. For example, 700 acres in Lee County, South Carolina were enrolled in WRP for environmental education.

Another site was donated to Arkansas State University for teaching a wetland restoration class. Not far away along the White River, the University of Arkansas at Pine Bluff is developing graduate school projects to conduct fish, reptile, and amphibian studies.



In northern California, fifth and sixth graders are monitoring wood duck nesting success on a WRP site.

Economics - WRP focuses on enrolling marginal lands having a history of crop failure or low yields. These areas are then targeted for the restoration and protection of wetland functions and values, especially for migratory birds and other wildlife.

In 1996, approximately $15 billion was spent on activities related to wildlife viewing. Restoring wetland habitat continues to bolster this segment of the economy.

WRP is putting money back into local economies by providing jobs to restore wetlands. In addition, many nurseries have focused on growing trees for use in wetland restoration.

Recreational hunting is being expanded through WRP, and landowners are generating income by selling hunting rights. WRP provides an opportunity for landowners with financial difficulties to remain on the land by using the easement payment to acquire land better suited for agricultural production or to reduce debt and develop alternative sources of income.

4.7 Cumulative Effects

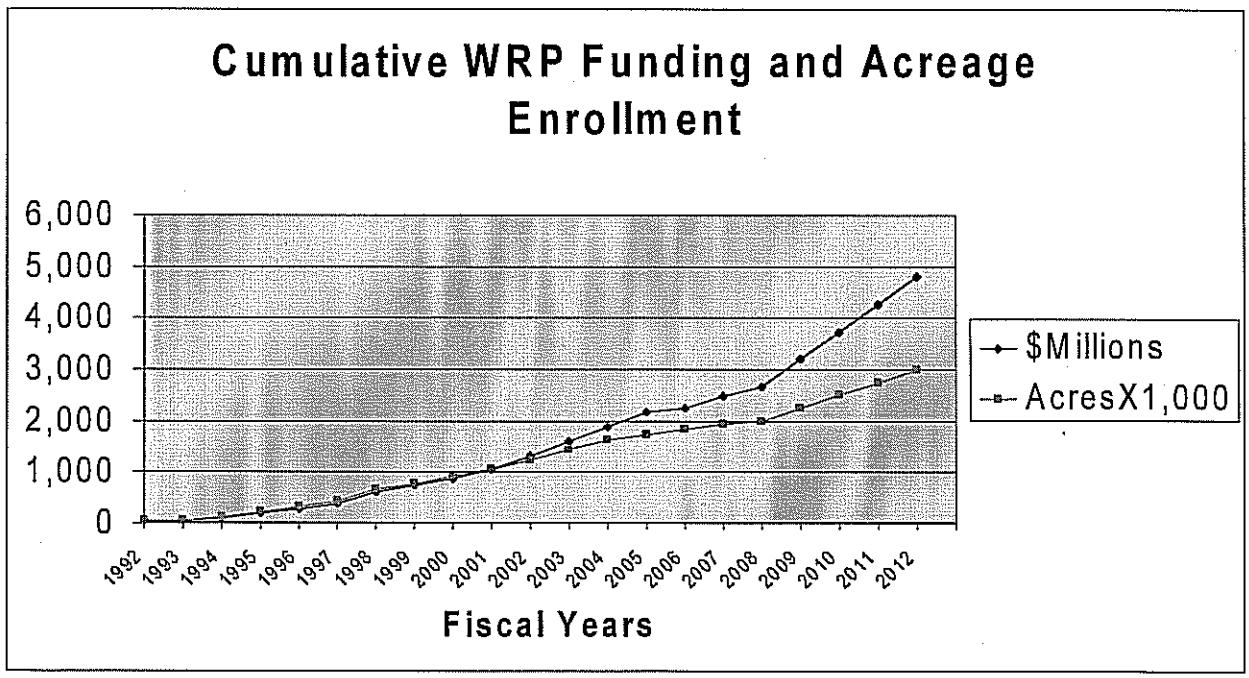
The proposed action extends the current WRP during FY 2008 – 2012 and is projected to increase the acreage enrolled in the program by an additional 20 percent. Figure 4.7.1 provides information portraying the past, present, and projected future funding levels and acreage.

WRP currently partners with numerous Federal and State entities to leverage resources, provide coordinated fish and wildlife habitat development, and enhancements. Primary national partners include the Cooperative State Research, Education, and Extension Service, USDA Forest Service, Environmental Protection Agency, and U.S. Fish and Wildlife Service. NRCS conservationists, State Fish and Wildlife agencies, State foresters, and nongovernmental organizations, such as Ducks Unlimited, also provide State support for WRP. If WRP is not continued, resources leveraged in the past would not be realized and the contributions of partners to the wetland resource would likely be considerably diminished in the future.

With the increased funding levels projected in the 2008 Farm Bill, it is anticipated that cumulatively, slightly more than 3 million acres will be enrolled in the program by the end of 2012 at a cost of $4.8 billion (Figure 4.7.2). The cumulative effects of individual NRCS conservation practices implemented through WRP can be viewed at:

http://www.nrcs.usda.gov/programs/Env_Assess/index.html

Figure 4.7.2 Cumulative WRP Funding and Acreage Enrollment, FY 1992 – 2012



Other NRCS programs in conjunction with WRP that provide secondary benefits to the development and enhancement of wetlands include the Environmental Quality Incentives Program, Wildlife Habitat Incentives Program, and Healthy Forest Reserve Program (HFRP). Each program has specific limitations on land eligibility and/or species addressed. For example, HFRP applies only to private forestland and federally listed and candidate species, State species of concern, or species identified by the Chief for special funding consideration.

Additionally, the U.S. Fish and Wildlife Service's Partners for the Fish and Wildlife Program provides technical and financial assistance to private landowners for wetland restoration on their lands. Fish and wildlife habitat restoration projects are limited to habitat for Federal trust species.

Any potential adverse effects from the implementation of WRP are generally mitigated through the application of the NRCS planning process (including the site-specific EE) and NRCS conservation practice standards. Mitigation is most commonly in the form of avoidance, minimization, or by applying additional associated practices to rectify the adverse impact.

5.0 PERSONS AND AGENCIES CONSULTED

Information about the persons and agencies consulted through the Farm Bill forums may be found at:

http://www.fas.usda.gov/info/factsheets/FB2007/farmbill2007forums.asp

NRCS technical personnel who provided significant contributions to this analysis include:

- Norman Melvin III, PhD. Wetland Team Leader, NRCS Central National Technology Support Center, Fort Worth, Texas
- Richard Weber, Wetland Hydrologist, NRCS Central National Technology Support Center, Fort Worth, Texas

6.0 APPENDICES

Appendix A - NRCS National Resource Concern

Table 6.0.2 Resource Concerns Analyzed

Resource Concern	Description of Concern	National Quality Criteria
Soil Erosion - Streambank	Accelerated loss of streambank soils restricts land and water use and management.	Accelerated streambank soil loss does not exceed a level commensurate with upstream land use and normal geomorphological processes on site.
Soil Erosion - Shoreline	Soil is eroded along shorelines by wind and wave action causing physical damage to vegetation, limiting land use, or creating a safety hazard.	Shoreline erosion is stabilized to a level that does not restrict the use or management of adjacent land, water, or structures.
Soil Condition - Subsidence	Loss of volume and depth of organic soils due to oxidation caused by above normal microbial activity resulting from excessive drainage or extended drought.	The timing and regime of soil moisture is managed to attain acceptable subsidence rates.
Water Quality - Excessive Nutrients and Organics in Surface Water	Pollution from natural or human induced nutrients such as N, P, S (including animal and other wastes) degrades surface water quality.	Nutrients and organics are stored, handled, disposed of, and managed such that surface water uses are not adversely affected.
Water Quality - Excessive Suspended Sediment and Turbidity in Surface Water	Pollution from mineral or organic particles degrades surface water quality.	Movement of mineral and organic particles is managed such that surface water uses are not adversely affected.
Air Quality - Excessive Greenhouse Gas – CO2 (carbon dioxide)	Increased CO2 concentrations are adversely affecting ecosystem processes.	Land use and management operations comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and local regulations.
Plant Condition – Threatened or Endangered Plant Species: Plant Species Listed or Proposed for Listing under the Endangered Species Act	The site includes individual, habitat, or potential habitat for one or more plant species listed or proposed for listing under the Endangered Species Act.	Populations and/or habitats of Threatened and Endangered plant species are managed to maintain, increase, or improve current populations, health, or sustainability.

Resource Concern	Description of Concern	National Quality Criteria
Plant Condition – Threatened or Endangered Plant Species: Declining Species, Species of Concern	The site includes individual, habitat, or potential habitat for one or more plant species that the State or Tribal government with jurisdiction, or the State Technical Committee has identified as a species of concern. This includes plant species that have been identified as candidates for listing under the Endangered Species Act.	Populations and/or habitats of plant species of concern are managed to maintain, increase, or improve current populations, health, or sustainability.
Plant Condition - Noxious and Invasive Plants	The site has noxious or invasive plants present.	The site is managed to control noxious and invasive plants and to minimize their spread.
Fish and Wildlife - Inadequate Food	Quantity and quality of food is unavailable to meet the life history requirements of the species or guild of species of concern.	Food availability meets the life history requirements of the species or guild of species of concern.
Fish and Wildlife – Inadequate Cover/Shelter	Cover/shelter for the species of concern is unavailable or inadequate. For aquatic species, this includes lack of hiding, thermal, and/or refuge cover.	The ecosystem or habit types support the necessary plant species in the kinds, amounts, and physical structure; and the connectivity of fish and wildlife cover is adequate to support, over time, the species of concern.
Fish and Wildlife – Inadequate Water	The quantity and quality of water is unacceptable for the species of concern.	The quantity and quality of water meets the life history requirements of the species of concern.
Fish and Wildlife – Inadequate Space	Lack of area and fragmentation of areas disrupt life history requirements of the species of concern.	Adequate area and connectivity of areas meet life history requirements of the species of concern (Examples: staging areas for rest and feeding, lekking areas for breeding, and migratory movement corridors).
Fish and Wildlife – Habitat Fragmentation	Habitat has insufficient structure, extent, and connectivity to provide ecological functions and/or achieve management objectives.	Fish and wildlife habitats are connected and are maintained sufficiently to support the species or guild of species of concern.
Fish and Wildlife – Threatened and Endangered Fish and Wildlife Species: Fish and Wildlife Species Listed or Proposed for Listing under the Endangered Species Act	The site includes individual habitat or potential habitat for one or more fish or wildlife species listed, or proposed for listing, under the Endangered Species Act.	Populations and/or habitats of Threatened and Endangered fish and wildlife species and/or habitats they occupy are managed to maintain, increase, or improve current populations, health, or sustainability.

Resource Concern	Description of Concern	National Quality Criteria
Fish and Wildlife – Threatened and Endangered Species: Declining Species, Species of Concern	The site includes individual habitat or potential habitat for one or more fish or wildlife species that the State or Tribal government with jurisdiction, or the State Technical Committee, has identified as a species of concern. This includes fish and wildlife species that have been identified as candidates for listing under the Endangered Species Act.	Populations and/or habitats of fish and wildlife species of concern are managed to maintain, increase, or improve current populations, health, or sustainability.