Programmatic Environmental Assessment

Republican River Basin and High Plains Region Conservation Reserve Enhancement Program Agreements for Colorado

Farm Service Agency
United States Department of Agriculture

DRAFT

March 2006

COVER SHEET

Proposed Action: The United States Department of Agriculture (USDA), Commodity Credit Corporation (CCC) and the State of Colorado have agreed to implement the Colorado Conservation Reserve Enhancement Program (CREP), a component of the Conservation Reserve Program. USDA is provided the statutory authority by the provisions of the Food Security Act of 1985, as amended (16 U.S. Code 3830 et seq.), and the Regulations at 7 Code of Federal Regulations (CFR) 1410. In accordance with the 1985 Act, USDA/CCC is authorized to enroll lands through December 31, 2007. The Farm Service Agency (FSA) proposes to enter into CREP Agreements with the State of Colorado. CREP is a voluntary land conservation program for agricultural landowners.

Type of Document: Programmatic Environmental Assessment

Lead Agency: USDA, FSA

Sponsoring Agency: Colorado Farm Service Agency (FSA)

Cooperating Agency: USDA, Natural Resource Conservation Service

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Comments: This Programmatic Environmental Assessment (PEA) was prepared in accordance with USDA FSA National Environmental Policy Act (NEPA) implementation procedures found in 7 CFR 799, as well as the NEPA of 1969, Public Law 91-190, 42 U.S.Code 4321-4347, 1 January 1970, as amended. Once this document is finalized a Notice of Availability will be printed in newspapers in the CREP areas and FSA will provide a public comment period prior to any FSA decision. A copy of this PEA can be found at:
http://www.fsa.usda.gov/dafp/cepd/epb/assessments.htm

Written comments regarding this assessment shall be submitted to:

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EXECUTIVE SUMMARY

This Programmatic Environmental Assessment describes the potential environmental consequences resulting from the proposed implementation of Colorado's Republican River Basin and High Plains Region Conservation Reserve Enhancement Program Agreements. The environmental analysis process is designed: to ensure the public is involved in the process and informed about the potential environmental effects of the Proposed Action; and to help decision makers take environmental factors into consideration when making decisions related to the Proposed Action.

This Programmatic Environmental Assessment has been prepared by the United States Department of Agriculture, Farm Service Agency in accordance with the requirements of the National Environmental Policy Act of 1969, the Council on Environmental Quality regulations implementing the National Environmental Policy Act, and 7 Code of Federal Regulations 799 *Environmental Quality and Related Environmental Concerns – Compliance with the National Environmental Policy Act*.

Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to implement Colorado's Conservation Reserve Enhancement Program Agreements. Under the Agreements, eligible farmland in the Republican River Basin and High Plains Region would be removed from production and approved conservation practices, such as grass planting, installation of riparian buffers, and wetland restoration, would be implemented. Landowners would receive annual rental payments and would be eligible for one-time incentive payments to support the implementation of the conservation practices.

Colorado's Conservation Reserve Enhancement Program Agreements are needed to meet the following goals:

- improve water quality,
- protect drinking water,
- control soil erosion,
- protect threatened and endangered species, and
- assist the State in complying with environmental regulations that are related to agriculture.

Additionally, agricultural lands in the High Plains region would be eligible for enrollment in the Environmental Quality Incentive Program. Under this program, conservation practices would be implemented on lands where agricultural production would continue.

Proposed Action and Alternatives

The Proposed Action would implement Colorado's Conservation Reserve Enhancement Program Agreements. This would remove 35,000 acres in the Republican River Basin and 30,000 acres in the High Plains Region of eligible agricultural land from production and establish approved conservation practices on the land. An additional 69,000 acres in the High Plains Region would be enrolled in the Environmental Quality Incentive Program but would remain in production as wildlife-managed croplands. The eligible lands are located in the following five counties: Kit Carson, Logan, Phillips, Sedgwick, and Yuma.

Landowners would enroll eligible farmland by entering into 14 or 15 year contracts with the Farm Service Agency. Conservation Practices would be established and maintained on enrolled lands for the contract duration. Landowners would receive annual rental payments for the duration of the contracts as well as financial and technical support for implementing and maintaining the practices. For lands enrolled in the program, annual rental payments would be the sum of the base soil rental rate, a one-time incentive payment, and the annual maintenance rate.

This Programmatic Environmental Assessment documents the analysis of the Proposed Action and the No Action Alternative. Under the No Action Alternative, no lands would be enrolled in the Republican River Basin or High Plains Region Conservation Reserve Enhancement Programs. None of the approved conservation practices or rental payments described would be implemented.

Summary of Environmental Consequences

It is expected that there would be positive and temporary localized minor negative impacts associated with implementation of the Proposed Action. A summary of the potential impacts is provided in Table ES-1.

Table ES-1 Summary of Environmental Consequences

Resource	Proposed Action	No Action Alternative
Biological Resources	Beneficial long-term impacts to biological resources are expected to occur under this alternative. The Proposed Action is expected to contribute to vegetation and wildlife diversity and reduced incidence of exotic and invasive species. Ground-nesting birds such as the Ring-necked Pheasant and Greater Prairie-chicken will benefit from additional habitat. Fisheries will benefit from increased water quantity and quality. Long term positive impacts to threatened and endangered species, species of concern, and their habitats are expected. It is possible that localized impacts to protected species could occur during activities associated with establishing the approved conservation practices.	Continued use of lands targeted by the proposed Conservation Reserve Enhancement Program as cropland and pastureland practices would decrease the quality of fisheries through degraded water quality and quantity associated with agricultural runoff. Further habitat loss through conversion of habitat into agricultural uses decreases available habitat for wildlife, and protected species. Habitat fragmentation and land disturbing activities encourage the spread of exotic species and potentially adversely affect wildlife habitat.
Cultural Resources	Archaeological resources and traditional cultural properties could be affected by the installation of the proposed conservation practices if ground disturbance associated with these activities is beyond what is normally disturbed by agricultural plowing. Impacts to architectural resources are not anticipated as none of the proposed conservation practices would alter National Register-listed or eligible structures. Contracts would require inspection for cultural resources prior to implementation of conservation practices.	No change in impacts to cultural resources would occur under the No Action Alterative if agricultural practices remain unchanged. If there were a change in agricultural lands or if lands not previously cropped were converted to agricultural production, impacts to cultural resources could occur.

Table ES-1 Summary of Environmental Consequences (cont'd.)

Resource	Proposed Action	No Action Alternative
Water Resources	Beneficial long-term positive impacts to surface and ground water quality are expected. Wetlands acreages are expected to increase as a result of the implementation of the proposed conservation practices. The quantity and quality of ground and surface water are also expected to increase as a result of reduced runoff, sedimentation, and application of agricultural chemicals. The approved conservation practices are expected to stabilize floodplains through the establishment of wetlands while also reducing runoff. Temporary minor localized impacts to existing wetlands and surface water quality may result from runoff during activities associated with the installation of the conservation practices.	Current land use practices are expected to continue and will negatively impact water quality, quantity and wetlands over the long-term.
Soil Resources	Positive impacts to localized area topography and soils are expected from implementation of the Proposed Action. The conservation practices would stabilize soils thereby decreasing the potential for soil erosion and reducing negative impacts to topography on enrolled lands.	Continued use of targeted lands for cropland and pastureland is expected to accelerate soil erosion and adversely impact soil resources in the long-term.

Table ES-1 Summary of Environmental Consequences (cont'd.)

Resource	Proposed Action	No Action Alternative
Recreational Resources	Positive long-term impacts on recreational resources are expected under this alternative. The proposed conservation practices are expected to increase habitat for terrestrial and aquatic game and non-game species thus improving opportunities for fishing, hunting, wildlife observation, and other outdoor recreational activities.	Continued use of cropland and pastureland practices would decrease the quality of fisheries through degraded water quality and quantity. Further habitat loss through conversion of habitat into agricultural uses would decrease available habitat for wildlife and negatively impact recreation associated with wildlife.
Socioeconomics	A slight benefit to the local economy is expected to result from the monies associated with the establishment and maintenance of the proposed conservation practices and the rental payments made to landowners. These impacts are considered minor in the context of the region of influence.	Socioeconomic conditions in the counties and State would continue to follow State and local trends. Farmland would continue to be sold for development with unique and prime farmland areas being targeted for purchase of conservation easements.
Environmental Justice	The project area is considered neither an impoverished area nor an area of concentrated minority population. Therefore no effect to environmental justice would occur.	If the Proposed Action were not implemented, there would be environmental justice concerns.

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ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Term
APCD	Air Pollution Control Division
BP	before present
CAFO	concentrated animal feeding operations
CDOW	Colorado Department of Wildlife
CDLE	Colorado Department of Labor and Employment
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CI	chemical inputs
CP	conservation practice
CPA	Conservation Priority Area
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
DMT	Delayed Minimum Tillage
EI	Erodibility Index
EO	Executive Orders
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
Farm Bill	Farm Security and Rural Investment Act of 2002
FEMA	Federal Emergency Management Agency
FIRM	flood insurance rate map
FR	Federal Register
FSA	Farm Service Agency
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPGCD	North Plains Groundwater Conservation District
NRCS	Natural Resource Conservation Service
OAHP	Office of Archaeology and Historic Preservation
PEA	Programmatic Environmental Assessment
PEIS	Programmatic Environmental Impact Statement
ROI	region of influence
SHPO	State Historic Preservation Office
TCP	traditional cultural property
TSP	Technical Service Provider
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WBP	Water Bank Program
WHIP	Wildlife Habitat Incentives Program
WRP	Wetlands Reserve Program

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1.0 INTRODUCTION

The United States Department of Agriculture (USDA) Farm Service Agency (FSA) proposes to implement two Conservation Reserve Enhancement Program (CREP) Agreements in the State of Colorado. This Programmatic Environmental Assessment (PEA) has been prepared to analyze the potential environmental consequences associated with implementation of the Proposed Action or No Action Alternatives.

1.1 Background

Regulatory Compliance

This PEA is prepared to satisfy the requirements of the National Environmental Policy Act (NEPA; Public Law 91-190, 42 U.S. Code 4321 et seq.); implementing regulations adopted by the Council on Environmental Quality (CEQ; 40 Code of Federal Regulations [CFR] 1500-1508); and FSA implementing regulations, Environmental Quality and Related Environmental Concerns – Compliance with NEPA (7 CFR 799). The intent of NEPA is to protect, restore, and enhance the human environment through well informed Federal decisions. A variety of laws, regulations, and Executive Orders (EO) apply to actions undertaken by Federal agencies and form the basis of the analysis prepared in this PEA. These include but are not limited to:

- Endangered Species Act,
- National Historic Preservation Act,
- Clean Air Act,
- Clean Water Act,
- EO 11514, Protection and Enhancement of Environmental Quality,
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, and
- EO 11988, Floodplain Management.

The Farm Service Agency and Conservation Reserve Program

FSA was established during the reorganization of USDA in 1994. The mission of FSA is to "ensure the well being of American agriculture, the environment and the American public through efficient and equitable administration of farm commodity programs; farm ownership, operating and emergency loans; conservation and environmental programs; emergency and disaster assistance; domestic and international food assistance and international export credit programs."

FSA's Conservation Reserve Program (CRP) is the Federal government's largest private land environmental improvement program. CRP is a voluntary program that supports the implementation of long term conservation measures designed to improve the quality of ground and surface waters, control soil erosion, and enhance wildlife habitat on environmentally sensitive agricultural land.

The environmental impact of CRP was studied in the 2003 Programmatic Environmental Impact Statement (PEIS). The Final PEIS for CRP was published in January 2003 and provides FSA decision makers with programmatic level analyses that provide a context for State specific PEAs. The Record of Decision for the PEIS was published in the *Federal Register* (FR 2003) on May 8, 2003 (68 FR 2487-24854).

Conservation Reserve Enhancement Program

CREP was established in 1997 under the authority of CRP. The purpose of CREP is to address agriculture related environmental issues by establishing conservation practices (CPs) on agricultural lands using funding from State, tribal, and Federal governments as well as non-government sources. Federal funding is provided by the Commodity Credit Corporation. CREP addresses high priority conservation issues in specific geographic areas such as watersheds. Owners of lands eligible for inclusion in CREP receive annual rental payments in exchange for implementing approved CPs. In addition, producers may receive one-time monetary and technical support for establishing these practices.

Statewide CREP Agreement proposals are developed by teams that can consist of State, tribal, Federal and local government agency representatives, producers and other stakeholders. CREP proposals are submitted to FSA by the State's Governor. An intra-agency panel then reviews the Agreement. A final CREP Agreement is set into practice through a Memorandum of Agreement between USDA and the Governor. CREP programs are limited to 100,000 acres per State.

Colorado's CREP Agreements would remove 35,000 acres in the Republican River Basin and 30,000 acres in the High Plains Region of eligible agricultural land from production and establish approved CPs on the land. The Republican River Basin and the High Plains Region support diverse wildlife and vegetative populations including several Federally listed, State listed, of State concern and/or of significant economic importance to the State of Colorado and the region. The proposed Colorado CREP addresses important environmental issues faced by the region including water quantity, water quality, soil erosion, wildlife habitat, and habitat restoration. Specific lands which would be enrolled in the program have not yet been identified. Once eligible lands are identified, site specific NEPA analysis would be completed.

Environmental Quality Incentives Program

EQIP is a conservation program that supports production agriculture and environmental quality as compatible goals through the implementation of certain CPs such as grassed waterways, filter strips, waste management facilities, grade stabilization structures, and other practices. Like CREP, the program offers technical and financial assistance to farmers and ranchers who face serious threats to soil, water, and related natural resources. 69,000 acres in the High Plains Region would be enrolled in EQIP but would remain in production as wildlife-managed croplands.

Republican River Basin

The Republican River Basin spans parts of eastern Colorado, western Kansas, and western Nebraska. The basin lies in Colorado's northern high plains, a semi-arid region that receives on average fewer than 20 inches of rainfall annually. It is a major contributor to the Ogallala Aquifer, which has been identified as a national concern regarding water quantity and quality. Over 4,000 wells tap into the Ogallala Aquifer supplying the basin's cropland, livestock, municipal, domestic, and commercial entities. Cattle feedlots and ranching, crops (corn and winter wheat), and hogs are the dominant agricultural trends in the Republican River Basin and are a source of nutrients and sediments within the basin. Republican River Basin native habitat can be broadly categorized into three complex types, plains forest riparian and wetlands, sandsage prairie, and loess prairie.

High Plains Region

The High Plains Region is found in eastern Colorado. The region is primarily comprised of cropland, large monolithic tracts of CRP lands, and remnant native prairie. The High Plains

Region is also a semi-arid region that receives an annual average precipitation that ranges from 13-17 inches. Like the Republican River Basin, it also is a major contributor to the Ogallala Aquifer, which has been identified as a national concern regarding water quantity and quality. The major crops in the region are winter wheat, corn, grain sorghum, millet, fallow, and sunflowers. Livestock and cropland industries are a major source of nutrients and sediments within the High Plains Region. The High Plains Region's native vegetation communities include short-grass, mid-grass and sandsage/warm-season grass. Portions of native prairie remain but are typically fragmented by croplands.

1.2 Purpose and Need

The purpose of the action is to implement Colorado's Republican River Basin and High Plains Region CREP Agreements. Under the Agreements, eligible agricultural land would be removed from production and approved CPs would be implemented on CREP lands. CPs would also be established on EQIP lands though these would remain in agricultural production. Producers would receive annual rental payments and would be eligible for one-time payments to support the implementation of CPs.

The need for the Proposed Action is to meet the overall goals of CREP, specifically, improve water quality, protect drinking water, control soil erosion, protect threatened and endangered species, and to assist the State in complying with environmental regulations that are related to agriculture in specific geographic regions.

1.3 Colorado CREP Objectives

CREP Agreements are designed to meet specific regional conservation goals and objectives related to agriculture. The Colorado CREP Agreements are divided into two geographical areas, the Republican River Basin and the High Plains Region, each with specific goals and objectives (Table 1.1).

1.4 Organization of PEA

This PEA assesses the potential impacts of the Proposed Action and the No Action Alternative on potentially affected environmental and economic resources. Chapter 1.0 provides background information relevant to the Proposed Action, and discusses its purpose and need. Chapter 2.0 describes the Proposed Action and alternatives. Chapter 3.0 describes the baseline conditions (i.e., the conditions against which potential impacts of the Proposed Action and alternatives are measured) for each of the resource areas while Chapter 4.0 describes potential environmental consequences on these resources. Chapter 5.0 includes analysis of cumulative impacts and irreversible and irretrievable resource commitments. Chapter 6.0 discusses mitigation measures. Chapter 7.0 is a list of the preparers of this document and Chapter 8.0 contains a list of persons and agencies contacted during the preparation of this document. Chapter 9.0 contains references used in the PEA.

Table 1.1 Colorado CREP Goals and Objectives

Republican River Basin	High Plains Region
Reduce soil erosion from 478,512 to approximately 105,000 tons per year on all acres enrolled in CREP.	Reduce soil erosion by combining the creation of permanent grass cover and adopting stubble retaining crop strategies on adjacent acres.
Reduce fertilizer and pesticide application by five percent over the total project area and eliminate the need for herbicide and fertilizer on all enrolled acres.	Eliminate herbicide use on all CREP acres and reduce use of herbicides that employ long and short term residual activities on actively growing green wheat and wheat stubble.
Establish a minimum of 30,000 acres of native grassland.	Increase soil moisture conservation and storage through retention of crop residues that efficiently trap and hold moisture, reduce runoff, and evaporation losses.
Restore and enhance a minimum of 500 acres of degraded wetlands.	Create 99,000 acres of high quality and diverse wildlife habitat, by enrolling 30,000 acres into CREP habitat resource blocks, and 69,000 acres of actively managed cropland habitat, with a minimum increase in "edge effect" of 50 percent on enrolled properties.
Reduce agricultural use of the Ogallala Aquifer by 5 percent over the total project area by retiring approximately 35,000 acre-feet of groundwater per year.	Increase recreational opportunity within the project range by enrolling 99,000 acres of habitat into the Walk-In Access program.
Increase streamflow in all streams associated with the Republican River Basin by up to five percent.	Provide incentive based voluntary program for producers to maintain a viable farming operation while accomplishing conservation objectives.
Reduce percentage of groundwater test wells containing nitrogen levels above U.S. Environmental Protection Agency (EPA) standards.	

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Proposed Action (Preferred Alternative)

FSA proposes to implement the Colorado CREP Agreements by enrolling lands within the Republican River Basin and High Plains Region to address several environmental issues of agricultural producers in Colorado. These Agreements would enroll 35,000 acres of environmentally sensitive agricultural lands in a five county region in Colorado's Republican River Basin and 30,000 acres in a five county region in Colorado's High Plains Region over the next several years. An additional 69,000 acres of cropland in the High Plains Region may be enrolled in 1-10 year contracts as wildlife-managed active croplands under EQIP. These croplands would remain in production.

The Proposed Action would include establishing contracts with owners of eligible lands in order to implement approved CPs. Producers would receive support for the costs of installing and maintaining such practices as well as annual rental payments for lands enrolled in the program.

Republican River Basin

The Republican River Basin CREP proposal seeks to enroll and permanently retire approximately five percent (30,000 acres) of the 560,000 acres of irrigated cropland in the five county CREP area of northeastern Colorado. Additionally, approximately 5,000 acres of dryland pivot-corners adjacent to enrolled irrigated pivot circles would be enrolled. These combined practices would establish permanent wildlife habitat (Figure 2.1). This will increase wildlife habitat connectivity through availability of vegetative corridors and have a positive affect on wildlife populations. Additional proposal goals include improved water quality through reduced chemical application, increased streamflow, increased soil moisture, decreased soil erosion, restored wetlands, increased native grasslands, restored riparian habitat, reduced energy consumption, reduced nitrogen levels in groundwater and increased available recreation land. Landowner participation is voluntary and financial incentives are offered for qualified lands (State of Colorado 2005b).

High Plains Region

The High Plains Region CREP proposal seeks to enroll and permanently retire approximately 30,000 acres of cropland in small (40 acre or less) parcels. This proposal also would implement Delayed Minimum Tillage (DMT) on adjacent acres through the EQIP program. These combined practices would establish permanent wildlife cover in eligible lands (Figure 2.1) while increasing availability of cover in adjacent croplands. This will restore wildlife habitat and lessen habitat fragmentation by increasing wildlife habitat connectivity through availability of vegetative corridors. This will positively affect wildlife populations especially ground-nesting birds like Ring-necked Pheasant (*Phasianus colchicus*) and Greater Prairie-chicken (*Tympanuchus cupido*). Additional proposal specific goals include improved water quality through reduced chemical application, increase soil moisture, decrease soil erosion, and increased recreational opportunity. Landowner participation is voluntary and financial incentives are offered for qualified lands (State of Colorado 2005a).

Eligible Lands

Table 2.1 shows the percentages of agricultural land, estimated acreage of cropland, estimated number of farms, and anticipated acreage for CREP enrollment in each county in the proposed CREP areas. Participation in CREP is voluntary; therefore, the anticipated acreage enrollment by county in Table 2.1 is estimated. The location, size, and number of tracts that would be enrolled

in CREP would be determined by individual contracts. Once eligible lands are identified, site-specific NEPA analysis would be completed prior to entering into contracts in accordance with current FSA policy.

Figure 2.1 Potential CREP Location in Northeastern Colorado

Table 2.1 Acreage of Agricultural Land Eligible for Enrollment in CREP

County	Anticipated CREP Enrollment (acres)	Percentage Agricultural Land	Estimated Acres of Cropland	Estimated Number of Farms
Republican River Basin (35,000)				
Kit Carson	TBD	61.4	849,670	678
Logan	TBD	48.4	570,050	930
Phillips	TBD	88.1	387,974	334
Sedgwick	TBD	52.7	184,784	188
Yuma	TBD	46.5	703,827	864
Subtotal	35,000	-	2,696,305	2,994
High Plains Region (30,000)				
Kit Carson	TBD	61.4	849,670	678
Logan	TBD	48.4	570,050	930
Phillips	TBD	88.1	387,974	334
Sedgwick	TBD	52.7	184,784	188
Yuma	TBD	46.5	703,827	864
Subtotal	30,000	-	2,696,305	2,994
Total CREP	**65,000**	**-**	**2,696,305**	**2,994**

Source: Republican River CREP Proposal (2005) and High Plains Region CREP Proposal (2005)

Lands within these counties eligible for enrollment in the proposed CREP would be required to meet the cropland eligibility criteria in accordance with policy set forth by the Farm Security and Rural Investment Act of 2002 (Farm Bill) and detailed in the FSA Handbook: Agricultural Resource Conservation Program for State and County Offices (2003). Eligible cropland must be planted or considered planted to agricultural commodity during four of the six crop years from 1996 through 2001, and must be physically and legally capable of being planted in a normal manner to an agricultural commodity as determined by County Committee. In addition, eligible cropland must fall into one or more of the following secondary categories:

- Cropland for a field or a portion of a field if the weighted average Erodibility Index (EI) for the three predominant soils of the new land on the acreage offered is eight or greater;
- Land currently enrolled in CRP scheduled to expire September 30 of the fiscal year the acreage is offered for enrollment; and
- Land enrolled in Water Bank Program (WBP) and the WBP contract expired in 2000, 2001, or 2002 is eligible if it meets the following:

- The acreage is not classified as naturally occurring shallow marsh, deep marsh, shallow open water, shrub swamp, or wooded swamp, as determined by NRCS or Technical Service Provider (TSP), including acreage protected by Federal agency easement or mortgage restriction, and
- Enrollment in CRP would enhance the environmental benefits of the site.

Establish Conservation Practices

CREP CPs that are proposed for implementation under the Colorado CREP are listed in Table 2.2. Also listed are the acreages proposed for each practice and the duration of contracts.

Table 2.2 Proposed Conservation Practices

Conservation Practice	Acres	Contract Duration (years)
Republican River Basin		
CP-2: Native Grasses	3,000	14 or 15
CP-4D (tall grass): Vegetative planting tall grass	22,000	14 or 15
CP-4D (short grass): Vegetative planting short grass	3,000	14 or 15
CP-21: Filter Strips	500	14 or 15
CP-22: Riparian Buffer	1,000	14 or 15
CP-23: Wetland Restoration	250	14 or 15
CP-23a: Playa lakes restoration	250	14 or 15
CP-4D: Dryland pivot corners	5,000	14 or 15
High Plains Area		
CP-4D: Permanent wildlife habitat (habitat resource blocks)	20,000	14 or 15
CP-4D: Permanent wildlife habitat (corner resource areas)	7,000	14 or 15
CP-24: Crosswind trap strips	3,000	14 or 15
CP-12: Wildlife food plot	optional	14 or 15
CP-329a: Pheasants (EQIP Program)	69,000	1 to 10

Sources:
Colorado's Republican River CREP Proposal (2005)
Colorado's High Plains Region CREP Proposal (2005)
Tim Davis, State Environmental Coordinator

Descriptions of the CPs are available in Appendix C. CPs may have additional land eligibility requirements. Preparation of lands for the installation of CPs may include the following approved actions:

- planting of temporary vegetative cover;
- application of nutrients, minerals, and seed;
- application of approved herbicides and pesticides;

- installation of a permanent water source for wildlife;
- grading, leveling, and filling;
- planting of tree and shrub seedlings;
- application of temporary irrigation system and plastic mulch;
- installation of rock-filled trenches to induce subsurface flow;
- installation of water gaps, bridges, or other livestock crossing facilities;
- installation of vegetative damage control devices such as tree shelters, netting, and plastic tubes;
- breaking tile to restore natural water flows;
- installation of structures designed to regulate flow such as pipe, chutes, and outlets;
- removal of existing vegetation or rocks; and
- installation of fencing, pipelines, and watering facilities.

Provide Financial Support

Producers enrolled in Colorado's CREP would enter 14 or 15 year contracts that stipulate implementation of approved CPs to receive financial and technical assistance. Enrolled program acres are permanently removed from irrigation and converted into suitable habitat. Producers are eligible for annual rental payments for the duration of the contract. Annual rental payments are calculated based on the number of acres enrolled in CREP. Additionally, one-time cost sharing and incentive payments are available to participants to aid in establishing CPs.

Producers enrolled in EQIP (High Plains Region only) would enter 1 to 10 year contracts that stipulate implementation of CP-329a. These 69,000 acres would remain in production as wildlife-managed croplands. Producers would receive incentive payments and cost sharing to assist in establishing the CP.

The estimated cost of implementing the proposed Republican River CREP Agreement is $66,295,000, with an estimated Federal commitment of $52,772,500 (79 percent) and State and local contributions of $13,522,500 (21 percent).

The estimated cost of implementing the proposed High Plains CREP Agreement is $25,289,250, with an estimated Federal commitment of $19,848,000 (79 percent) and a partner contribution of $5,441,250 (21 percent).

2.2 Scoping

Discussion

Scoping is a process used to identify the scope and significance of issues related to a Proposed Action while involving the public and other key stakeholders in developing alternatives and weighing the importance of issues to be analyzed in the PEA. Those involved in the scoping process included Federal, State and local agencies, and any other interested persons or groups. One function of scoping is to resolve any conflicts or concerns (i.e., issues) prior to publication of a proposed project. The input gathered from scoping efforts is used during preparation of the proposed project.

Colorado's scoping process was initiated through discussion at the State Technical Committee meetings on June 28, 2004 and March 15, 2005. A press release was issued on March 18, 2005 informing the public of four outreach meetings to be held concerning the CREP program. These

meetings were held in Wray, Colorado on March 28, 2005; Burlington, Colorado on March 29, 2005; Holyoke, Colorado on April 6, 2005; and Yuma, Colorado on April 7, 2005. The purpose of these meetings was to gather public input as the State of Colorado began to apply for Federal funds through submission of a CREP proposal to USDA. See Appendix D for a list of individuals and entities that have been involved and are supportive of the Colorado CREP proposals.

Resources Eliminated from Analysis

CEQ regulations (§1501.7) state that the lead agency shall identify and eliminate from detailed study the issues which are not important or which have been covered by prior environmental review, narrowing the discussion of these issues in the document to a brief presentation of why they would not have a dramatic effect on the human or natural environment. In accordance with §1501.7, issues eliminated from detailed analysis in this PEA include the following:

Traffic and Transportation

The Proposed Action or alternative would not increase or decrease the demand for traffic and transportation at or adjacent to the project area.

Noise

Implementing the Proposed Action or alternative would not permanently increase ambient noise levels at or adjacent to the project area. Increased noise levels associated with implementing CPs would be minor, temporary, and would cease once implementation of the approved CPs were completed.

Air Quality

The Proposed Action is not expected to impact either local or regional air quality. Temporary minor impacts to local air quality as a result of soil disturbance during installation of conservation practices would not differ measurably from those resulting from continued use of the land for agriculture, would not exceed ambient air quality standards, and would not violate the State Implementation Plan.

Human Health and Safety

Enrolling lands in CREP is not expected to appreciably affect human health and safety.

Coastal Zones

The Proposed Action or alternative area lies within the interior of the United States and does not include any coastal zones.

Other Formally Classified Lands

The proposed project area does not include any Wild and Scenic Rivers, National Natural Landmarks, Wilderness Areas, National Forests, National Parks, National Monuments, or National Grasslands.

2.3 Alternatives Eliminated from Analysis

Colorado considered other basins including Rio Grande, Arkansas, San Juan, and South Platte Rivers as alternatives to the Republican River Basin. The Republican River was chosen for several factors that included available matching funds and current wildlife and water quality concerns. In addition, counties such as Prowers, Baca, Cheyenne, Kiowa, and Washington were considered for inclusion in the High Plains Region proposal. The current counties were chosen for reasons that included funding, eligible acres, and locations within core Ring-necked Pheasant range.

Implementation of portions of Colorado's CREP Agreements was considered but eliminated from analysis. Partial implementation of the Agreements would be inconsistent with new enrollment guidelines and would not contribute to meeting the acreage enrollment goals required by the Farm Bill. Additionally, other CPs were considered but were deemed inadequate for meeting Colorado's CREP program goals. The CPs eliminated from the Republican River Basin proposal were CP-27 and CP-33 due to inadequate fit with the CREP proposals goals. The High Plains Region proposal removed CP-21 and CP-22 from consideration due to legal constraints.

2.4 Alternatives Selected for Analysis

Alternative A – Preferred

Under Alternative A, Colorado's CREP Agreements would be fully implemented as described above. A full 35,000 acres of eligible lands in five counties in the Republican River Basin and 30,000 acres of eligible lands in five counties in the High Plains Region would be removed from production. An additional 69,000 acres within the High Plains Region may be enrolled into 1 to 10-year contracts as wildlife-managed lands under the guidance of the EQIP program. These croplands would not be removed from agricultural production. CPs would be established on those lands and producers would receive one-time and annual rental payments.

Alternative B – No Action

Under the No Action Alternative, the State of Colorado's CREP Agreements would not be implemented. No land would be enrolled in CREP and the goals of the CREP would not be met. Though eligible lands could be enrolled in CRP or other conservation programs, the benefits of CREP – targeting land in Colorado's watersheds for enrollment, providing financial incentives to producers, using non-Federal financial resources – would not be realized. This alternative does not satisfy the purpose and need but will be carried forward in the analysis to serve as a baseline against which the impacts of the Preferred Alternative can be assessed.

2.5 Comparison of Alternatives

Table 2.3 provides a summary comparison of the potential impacts to each resource resulting from the Proposed Action and No Action Alternative. This table provides a summary of the environmental consequences to all resources associated with implementing those alternatives carried forward for detailed analysis and indicates that only the Proposed Action would meet the established purpose and need for the Proposed Action. As demonstrated in Table 2.3, none of the alternatives carried forward for detailed analysis are expected to result in major impacts to the environment.

Table 2.3 Alternatives Comparison Summary

Resource	Proposed Action	No Action Alternative
Biological Resources	Beneficial long-term impacts to biological resources are expected to occur under this alternative. The Proposed Action is expected to contribute to vegetation and wildlife diversity and reduced incidence of exotic and invasive species. Ground-nesting birds such as the Ring-necked Pheasant and Greater Prairie-chicken will benefit from additional habitat. Fisheries will benefit from increased water quantity and quality. Long term positive impacts to threatened and endangered species, species of concern, and their habitats are expected. It is possible that localized impacts to protected species could occur during activities associated with establishing the approved conservation practices.	Continued use of lands targeted by the proposed Conservation Reserve Enhancement Program as cropland and pastureland practices would decrease the quality of fisheries through degraded water quality and quantity associated with agricultural runoff. Further habitat loss through conversion of habitat into agricultural uses decreases available habitat for wildlife, and protected species. Habitat fragmentation and land disturbing activities encourage the spread of exotic species and potentially adversely affect wildlife habitat.
Cultural Resources	Archaeological resources and traditional cultural properties could be affected by the installation of the proposed conservation practices if ground disturbance associated with these activities is beyond what is normally disturbed by agricultural plowing. Impacts to architectural resources are not anticipated as none of the proposed conservation practices would alter National Register-listed or eligible structures. Contracts would require inspection for cultural resources prior to implementation of conservation practices.	No change in impacts to cultural resources would occur under the No Action Alterative if agricultural practices remain unchanged. If there were a change in agricultural lands or if lands not previously cropped were converted to agricultural production, impacts to cultural resources could occur.

Table 2.3 Alternatives Comparison Summary (cont'd.)

Resource	Proposed Action	No Action Alternative
Water Resources	Beneficial long-term positive impacts to surface and ground water quality are expected. Wetlands acreages are expected to increase as a result of the implementation of the proposed conservation practices. The quantity and quality of ground and surface water are also expected to increase as a result of reduced runoff, sedimentation, and application of agricultural chemicals. The approved conservation practices are expected to stabilize floodplains through the establishment of wetlands while also reducing runoff. Temporary minor localized impacts to existing wetlands and surface water quality may result from runoff during activities associated with the installation of the conservation practices.	Current land use practices are expected to continue and will negatively impact water quality, quantity and wetlands over the long-term.
Soil Resources	Positive impacts to localized area topography and soils are expected from implementation of the Proposed Action. The conservation practices would stabilize soils thereby decreasing the potential for soil erosion and reducing negative impacts to topography on enrolled lands.	Continued use of targeted lands for cropland and pastureland is expected to accelerate soil erosion and adversely impact soil resources in the long-term.

Table 2.3 Alternatives Comparison Summary (cont'd.)

Resource	Proposed Action	No Action Alternative
Recreational Resources	Positive long-term impacts on recreational resources are expected under this alternative. The proposed conservation practices are expected to increase habitat for terrestrial and aquatic game and non-game species thus improving opportunities for fishing, hunting, wildlife observation, and other outdoor recreational activities.	Continued use of cropland and pastureland practices would decrease the quality of fisheries through degraded water quality and quantity. Further habitat loss through conversion of habitat into agricultural uses would decrease available habitat for wildlife and negatively impact recreation associated with wildlife.
Socioeconomics	A slight benefit to the local economy is expected to result from the monies associated with the establishment and maintenance of the proposed conservation practices and the rental payments made to landowners. These impacts are considered minor in the context of the region of influence.	Socioeconomic conditions in the counties and State would continue to follow State and local trends. Farmland would continue to be sold for development with unique and prime farmland areas being targeted for purchase of conservation easements.
Environmental Justice	The project area is considered neither an impoverished area nor an area of concentrated minority population. Therefore no effect to environmental justice would occur.	If the Proposed Action were not implemented, there would be environmental justice concerns.

2.5.1 Identification of Geographical Boundaries

In Colorado, the Republican River Basin is located within Kit Carson, Lincoln, Logan, Phillips, Sedgwick, Washington, and Yuma counties (Figure 2.2). The proposed Republican River Basin CREP project area consists of 7,761 square miles (4,967,040 acres) or 7.5 percent of Colorado's 104,247 square miles (66,718,080 acres). The proposed project area is comprised of 4,042,808 acres of cropland of which 561,271 acres are irrigated land and 3,481,537 acres are dry cropland. Colorado has established a Conservation Priority Area (CPA) in five of the seven basin counties: Kit Carson, Logan, Phillips, Sedgwick, and Yuma. The remaining two counties, Lincoln and Washington, are currently enrolled to the maximum extent allowed by the CRP. If additional acreage becomes available due to expired contracts, these counties may be added by amendment of the CPA.

The High Plains Region is located in five Colorado counties: Kit Carson, Logan, Phillips, Sedgwick, and Yuma (Figure 2.2). The High Plains region includes parts of two watersheds; the South Platte and the North and South Fork of the Republican River. The proposed High Plains Region CREP project area is comprised of 2,696,305 acres of cropland of which 523,148 acres are irrigated land and 2,173,157 acres are dry cropland. The proposed High Plains CREP Agreement would enroll in these five counties 30,000 acres of eligible agricultural lands that would be retired and an additional 69,000 of eligible adjacent acres that would be retained in agricultural production.

2.5.2 Temporal Boundaries

Producers enrolled in Colorado's CREP enter 14 or 15-year contracts that stipulate implementation of CPs to receive financial and technical assistance. These enrolled program acres would be converted into appropriate habitat. In addition, producers in the High Plains Region could also enroll in 1 to 10-year contracts under EQIP that stipulate implementation of CP-329a. These acres continue as actively managed wildlife-friendly cropland.

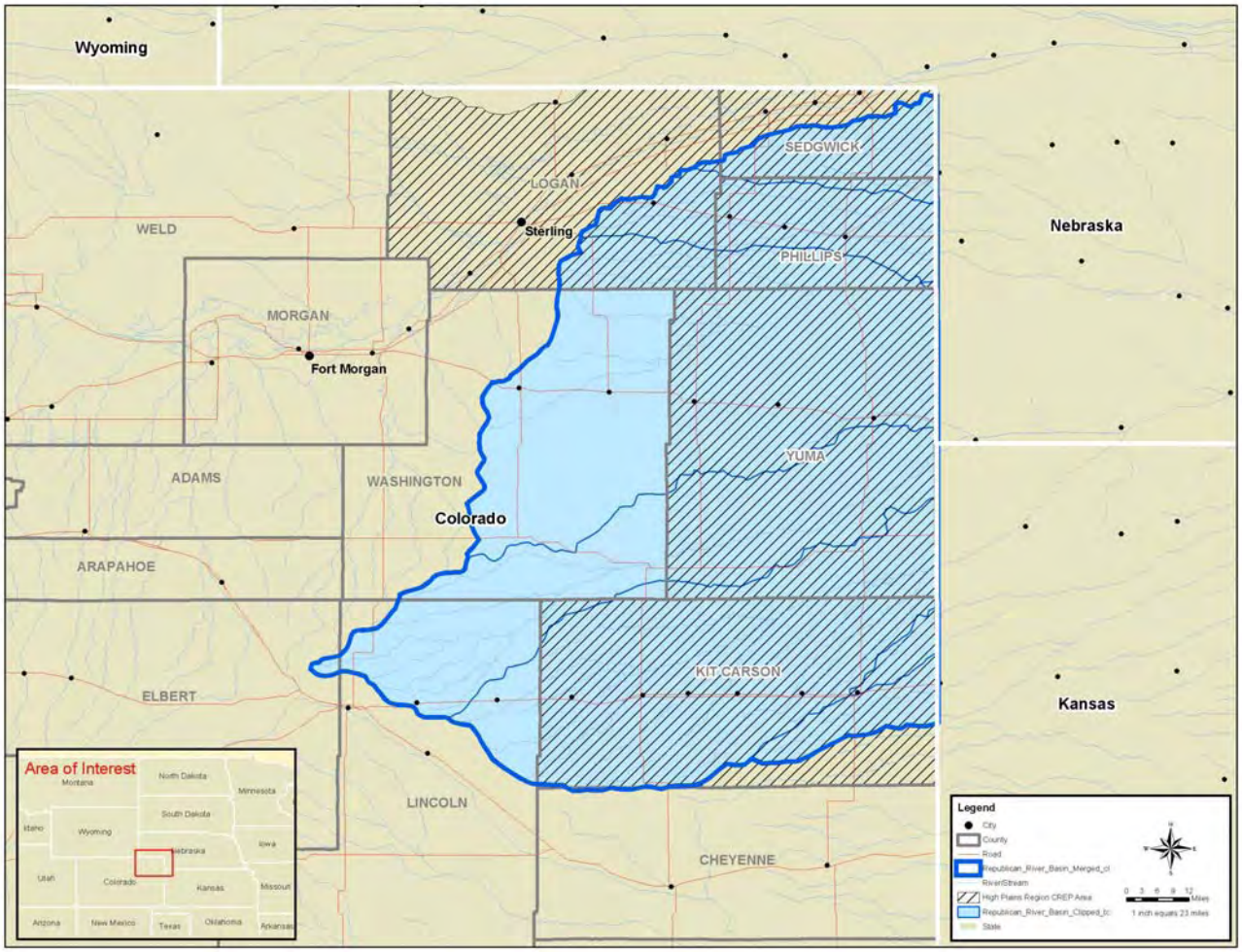


Figure 2.2 Republican River Basin and CREP Area in Colorado

3.0 AFFECTED ENVIRONMENT

3.1 Biological Resources

3.1.1 Description

Biological resources include plant and animal species and the habitats within which they occur. For this analysis, these resources are divided into three categories: vegetation; wildlife and fisheries; and protected species and habitat. Vegetation, fisheries, and wildlife refer to the plant and animal species, both native and introduced, which characterize a region. Protected species are those species that are protected by the Endangered Species Act (ESA) or similar State laws. Critical habitat is designated as habitat necessary for the recovery of Federally protected species, and like these species, such habitat is protected under the ESA.

3.1.2 Affected Environment

The affected environment for biological resources is the area encompassed by the proposed Republican River and High Plains Region CREP proposals as well as directly downstream from the CREP areas. Both of these CREP proposals include all or part of the following counties: Phillips, Sedgwick, Logan, Yuma, and Kit Carson.

Vegetation

Ecoregions are defined as areas of relatively homogenous ecological systems that contain similar soils, vegetation, climate, and geology. North America is divided into four levels of ecoregions and these ecoregions are further divided into divisions and provinces. The entireties of the proposed CREP area are within the Dry Domain Ecoregion, Temperate Steppe Division, and Great Plains-Palouse Dry Steppe Province (Bailey 1995).

A Dry Domain Ecoregion is defined as an area that annual losses of water through evaporation at the earth's surface exceed annual gains from precipitation. Due to the resulting water deficiency, no permanent streams originate in this ecoregion (USFS 2006). Vegetation native to this domain includes a variety of species adapted to low precipitation conditions.

Temperate Steppe Division is defined as areas with a semiarid climatic regime in which evaporation usually exceeds precipitation. Summers are warm to hot and winters are cold and dry. Vegetation is typically shortgrass prairie and semidesert and typical steppe vegetation consist not only of shortgrass species but scattered shrubs and low trees. Groundcover is typically sparse, so soil is usually exposed. Trees are usually not present (Bailey 1995).

The CREP area further lies within the Great Plains-Palouse Dry Steppe Province. This specific area is defined by rolling plains and tablelands of moderate relief that slopes gradually eastward from an altitude of 5,500 ft. (1,520 m) near the foothills of the Rocky Mountains to 2,500 ft. (760 m) in the Central States. The plains are flat with the occasional valley, butte, or canyon. The CREP area lies within the rain shadow east of the Rocky Mountains with maximum rainfall during the summer months. Steppe, sometimes referred to as shortgrass prairie, is a class of short grasses usually bunched and sparsely distributed. The Great Plains grasslands east of the Rocky Mountains have scattered trees and shrubs, such as sagebrush (*Artemisia* spp.) and rabbitbrush (*Chrysothamnus* spp.). Other species of grasses and plants that grow within this province are buffalo grass (*Buchloe* spp.), sunflower (*Eriophyllum* spp.), grama (*Bouteloua* spp.), and needlegrass (*Achnatherum* spp.). Wildflower species include blazingstar (*Mentzelia* spp.) and prickly poppy (*Argemone* spp.); (Bailey 1995).

Within the Republican River CREP project area, vegetation can be categorized into three habitat types (State of Colorado 2005b). The Plains Forest Riparian and Wetlands Complex is located along permanent stretches of the river and tributaries within the High Plains. Riparian systems dominated by plains cottonwood (*Populus deltoides* spp. *monilifera*) and peachleaf willow (*Salix amygdaloides*) occur with understory consisting of switch grass (*Panicum virgatum*) and Indian grass (*Sorghastrum* spp.). The Sandsage Prairie or Sandsage/Bluestem Complex is characterized by sandsage (*Artemisia filifolia*), prairie sandreed (*Calamovilfa longifolia*), and sand bluestem (*Andropogon hallii*) with western wheat grass (*Pascopyrum smithii*) and switch grass existing in varying amounts. The dominant shrub species is sandsage, but prickly pear (*Opuntia* spp.) and yucca (*Yucca* spp.) can also occur. The Loess Prairie Complex is a high quality, wind-deposited mixed and short grass prairie. This complex consists of bluestem, buffalo grass, western wheat grass, and grama. Playa lakes occur in the short grass region of this complex (State of Colorado 2005b).

Historically, much of the High Plains CREP area consists of native prairie supporting mid-grass and warm-season grass systems along with short grass communities. Only a small portion of native prairie remains due to conversion to other land use types. Large portions of Sandsage Prairie remain, although it is often interspersed with cropland (State of Colorado 2005a).

There are 16 known invasive species that are found within the Republican River and High Plains CREP area (Table 3.1). Most of these plants originated from Europe or Asia either accidentally or as planted ornamentals that escaped. Invasive or non-native plants can spread at alarming rates and can displace native plant populations because insects, diseases, and animals that would normally control them are not found in North America.

Table 3.1 Invasive Species Located Within CREP Area

Common Name	Scientific Name
Canada Thistle	*Cirsium arvense*
Diffuse Knapweed	*Centaurea diffusa*
Field Bindweed	*Convolvulus arvensis*
Hoary Cress	*Cardaria draba*
Jointed Goatgrass	*Aegilops cylindrica*
Leafy Spurge	*Euphorbia esula*
Musk Thistle	*Carduus nutans*
Perennial Pepperweed	*Lepidium latifolium*
Purple Loosestrife	*Lythrum salicaria*
Russian Knapweed	*Acroptilon repens*
Showy Milkweed	*Asclepias speciosa*
Skeleton-leaf Bursage or Silver-leaf	*Ambrosia tomentosa*
Spotted Knapweed	*Centaurea maculosa*
Woolly-leaf Bursage or Woolly-leaf	*Ambrosia grayi*

Wildlife and Fisheries

Wildlife and fisheries refer to the animals and fish that inhabit the project area and the habitats in which they live. Fisheries include areas directly downstream from the CREP areas. The Colorado Division of Wildlife (CDOW) has legal authority over Colorado's fish and wildlife, which includes a total of 960 native species, including mammals, birds, fish, reptiles, amphibians,

mollusks, and crustaceans. Approximately 186 species are pursued recreationally through activities such as hunting and fishing, hence are classified as game wildlife. Non-game species are also of interest for uses such as nature study, photography, and bird watching. Colorado manages wildlife at the species, subspecies, and population level, as well as managing the various habitats important to them (CDOW 2005a). See Appendix H for a list of the more common species found throughout the CREP project area.

The High Plains and Republican River CREP areas include most of the Ring-necked Pheasant range found within the State. The pheasant populations have been consistently monitored through census trend routes and other survey. The trend data is a good indicator of habitat quality within the CREP area because their habitat matches that of other ground-nesting birds (State of Colorado 2005a).

The CREP area also includes a portion of the range of the Greater Prairie-chicken. Population trend data is collected annually and these trends are also used as indicators of good habitat for other ground-nesting birds. In 1989, the Greater Prairie-chicken population numbered only 6,000 to 10,000 birds most of which were found in Yuma County (CDOW 2005g). Rather than being classified as a game bird, the Greater Prairie-chicken is considered a viewable resource. Bird watchers come to the High Plains area every year to witness the "booming" ritual of this bird. The Greater Prairie-chicken provides economic benefits to the area through organized tours and the associated profit by local businesses (i.e. restaurants, hotels) in support of this recreational activity.


Greater Prairie Chicken

The wildlife community specifically within the bounds of the Republican River CREP area includes 45 mammals, 269 birds, 33 fish, and 32 reptiles and amphibians. Bobwhite are associated with the riparian habitats along the river, but their numbers have been in decline because of vegetative changes within riparian zones. Due to intensive irrigation practices, these areas are becoming drier and plant species that had historically provided food and shelter for the Bobwhite Quail are now being replaced by plant species that respond well to dryer habitat (State of Colorado 2005b).

The use of fertilizer on agricultural lands within the Republican River CREP area has affected aquatic species by increased nitrogen and phosphorous loading. Species that cannot tolerate such high levels of nutrients tend to show declines in their population numbers over an extended period of time. The suckermouth minnow (*Phenacobius mirabilis*), brassy minnow (*Hybognathus hankinsoni*), plains minnow (*Hybognathus placitus*), stonecat (*Noturus flavus*), and orangethroat darter (*Etheostoma spectabile*) are some fish whose populations have been negatively affected by increased sedimentation and fertilizer run-off (State of Colorado 2005b).

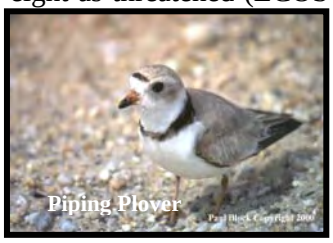
Throughout the CREP area agriculture has been shown to have strong effects on wildlife abundance. Early farming activities increased some species, but continued intensity and expansion of agriculture eventually decreased the benefits to most wildlife (State of Colorado 2005b). Grassland bird numbers have been shown in decline within the area due to habitat fragmentation and lack of nesting and brood-rearing habitat, and fish numbers are also declining due to high nutrient run-off into local streams, rivers, and tributaries.

Protected Species and Habitat

Protected species refer to those species that are protected under the ESA or similar State laws. Protected habitat is generally associated with protected wildlife or vegetation species. If

associated with a Federally protected species, habitat is designated by the U.S. Fish and Wildlife Service as Critical Habitat since it is essential for the recovery of those species. Like those species, the habitat is also protected by ESA.

In Colorado, there are 11 animal species listed by the Federal government as endangered and eight as threatened (ECOS 2006). Of these, there are five mammals, seven birds, five fish, and two insects. However, within the CREP area, there are only four Federally threatened and endangered species known to occur (NDIS 2006; CDOW 2005f). These Federally protected species include Bald Eagle (*Haliaeetus leucocephalus*), Piping Plover (*Charadrius melodus circumcinctus*), Whopping Crane (*Grus Americana*), and black-footed ferret (*Mustela nigripes*). The State of Colorado also lists and protects rare species in Colorado within its borders. These designations include endangered, threatened and species of special concern. Within the CREP area, there are six fish, three amphibians, four reptiles, 12 birds, and four mammals that are State listed (Appendix H; CDOW 2005f).


Piping Plover


Black-footed Ferret

There are six plant species listed as endangered, seven listed as threatened, and three as candidates for listing by the Federal government as well. The Colorado Natural Heritage Program lists 145 plants (Appendix H), including the previously mentioned 16 Federally listed plants, that have a rank of S1 (critically imperiled) or S2 (imperiled; CSU 1999).

3.2 Cultural Resources

Cultural resources consist of prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activities considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources can be divided into three major categories: archaeological resources (prehistoric and historic), architectural resources, and traditional cultural properties (TCPs). Archaeological resources are locations and objects from past human activities. Architectural resources are those standing structures that are usually over 50 years of age and are of significant historic or aesthetic importance to be considered for inclusion in the National Register of Historic Places (National Register). Traditional cultural resources hold importance or significance to American Indians or other ethnic groups in the persistence of traditional culture.

The significance of such resources relative to the American Indian Religious Freedom Act, the Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, EO 13007, and/or eligibility for inclusion in the National Register is considered a part of the EA process. The regulations and procedures in 36 CFR 800, which implements Section 106 of the National Historic Preservation Act (NHPA), requires Federal agencies to consider the effects on properties listed in or eligible for inclusion in the National Register. Prior to approval of the Proposed Action, Section 106 requires that the Advisory Council on Historic Preservation be afforded the opportunity to comment. In the State of Colorado, the State Historic Preservation Office (SHPO) is located at the Office of Archaeology and Historic Preservation (OAHP), Colorado Historical Society in Denver.

3.2.1 Archaeological Resources

3.2.1.1 Description

Human habitation in Colorado is thought to have begun about 12,000 years ago with arrival of humans from Eurasia across the eastern plains. The earliest peoples who came to this region are referred to as Paleoindians and were sustained by the region's rich wildlife, plants, and mineral resources. The Paleoindian period is divided into three subperiods, beginning with Clovis (12,000-11,000 before present [BP]), followed by the Folsom (11,000-10,000 BP), and Plano (10,000-7,500 BP). Paleoindians subsisted by hunting large game animals such as mammoth, bison, giant bear, dire wolf, horse, and camel, as well as smaller game, including deer and antelope. The gathering of wild plants also provided important food and subsistence resources. Evidence of Paleoindian occupation in Colorado is marked by the presence of unique stone and bone implements.

The ensuing Archaic stage is marked by a period of climatic change during which a significant reorientation of lifeways occurred. The archaeological record indicates a more diverse tool kit, including the widespread use of ground stone tools, indicative of changing diet and subsistence. Archaeological evidence demonstrates that social and cultural adaptations occurred over millennia although many cultural elements persisted for centuries at a time. In eastern Colorado the Late Prehistoric stage (1450 - 400 BP) witnessed a significant shift toward smaller projectile points, and the use of clay pots for cooking and storage. Horticulture was also practiced during this period. Various native cultures existed in the region for thousands of years while others were short-lived; as such, some cultures contributed more to the Indian tribes present at the time of European contact (Protohistoric stage) than others.

The earliest recorded European explorers in northeastern Colorado were the Spanish, whose expeditions reached the Great Plains in the 1540s. Motivated by the search for gold, the Spanish organized numerous expeditions to explore uncharted regions of the West. In the early 1700s, other Europeans, particularly the French, violated Spanish claims to the area by trading with American Indians. In 1803, northeastern Colorado was purchased by the United States from France as part of the Louisiana Territory. During the early nineteenth century, Euro-Americans were attracted to the region for the fur trade, followed by a gold rush in the latter part to the century. Several historical themes are identified associated with the arrival of Euro-Americans to Colorado; these include: Euro-American Explorations and the Fur Trade; the Colorado Gold Rush and Early Settlement; the Railroad Era; Agriculture and Ranching; Growth of Urban Areas; and Post World War II Era.

The Colorado OAHP maintains records of more than 145,000 historic properties throughout the State (Colorado Preservation 2005:36-38). In addition to the National Register, the OAHP maintains a State Register of significant historic properties. In 2002, nearly 7,000 cultural resources were added to the OAHP database. Prehistoric sites recorded throughout the State include lithic scatters, stone circle sites (tipi rings), rock cairns and alignments, buffalo kill sites, rock quarries, rock art sites (pictographs and petroglyphs), and stone tool quarries where stone tools were made. Historic archaeological resources include early trails and camp sites, homesteads, military forts, posts, battlefields, early recreation sites, historic trails, abandoned railroad corridors, early irrigation features, and mining sites.

Although there are hundreds of historic properties listed in the National Register in Colorado, only a small fraction are archaeological sites. However, there are several thousand historic properties, including hundreds of prehistoric and historic archaeological sites that have been formally determined eligible for listing in the National Register, but lack the level of documentation required for nomination. These resources are treated as if they were listed in the National Register for the purposes of compliance with Federal and State preservation laws. It is estimated that only 4 percent of the State's 104,247 square miles has been surveyed for archaeological resources (OAHP 2005).

3.2.1.2 Affected Environment

There are no National Register-listed archaeological sites in Kit Carson, Logan, Phillips, or Sedgwick counties (Table 3.2). Only one National Register-listed archaeological site is located in the CREP counties, consisting of the Beecher Island Battleground in Yuma County, a significant marker of nineteenth-century U.S. Military and American Indian conflict. The total number of National Register-eligible (but not listed) archaeological sites in the CREP area counties is unknown.

Table 3.2 National Register and State Register Archaeological Sites located in High Plains and Republican River CREP Area Counties, Colorado

County	National Register Listed Archaeological Sites	State Register Listed Archaeological Sites
Kit Carson	0	0
Logan	0	0
Phillips	0	0
Sedgewick	0	0
Yuma	1	1
Total	**1**	**1**

Source: Colorado OAHP, National Register Database (January 3-10, 2006)
http://www.coloradohistory-oahp.org/programareas/register

3.2.2 Architectural Resources

3.2.2.1 Description

Colorado historic architectural resources include homesteads, log cabins, forts, missions, mining ore houses and mills, adits, headframes, grain elevators, barns and farmhouses, Federal buildings, banks, stores, schoolhouses, and churches, all of which reflect the State's heritage. As indicated in the previous section, these historic architectural resources may be organized under historical themes that reflect Euro-American presence in the region from the early nineteenth century to the post World War II era. These themes include Euro-American Explorations and the Fur Trade; the Colorado Gold Rush and Early Settlement; the Railroad Era, Agriculture and Ranching; Growth of Urban Areas; and Post World War II Era. National Register-eligible architectural resources may also be organized into Historic Districts, which can contain a collection of individual properties reflecting a common historic theme within a defined geographical boundary.

3.2.2.2 Affected Environment

Although there are no Historic Districts located in the CREP area counties there is a total of 22 individual National Register-listed properties and 34 State Register properties recorded (Table 3.3). Logan County has the highest number of National Register and State Register historic properties. Kit Carson County also contains a National Historic Landmark—the Elitch Gardens Carousel. There is an unknown number of National Register-eligible architectural resources in the CREP area counties but, as indicated above, there are hundreds of architectural resources State-wide that are formally eligible but not listed.

Table 3.3 Numbers of National Register and State Register Listed Historic Districts and Individual Historic Properties in High Plains and Republican River CREP Area Counties, Colorado

County	National Register Listed Historic Districts	National Register Listed Properties	State Register Listed Properties
Kit Carson	0	5	6
Logan	0	9	12
Phillips	0	4	7
Sedgwick	0	1	4
Yuma	0	3	5
Total	**0**	**22**	**34**

Source: Colorado OAHP, National Register Database (January 3-10, 2006)
http://www.coloradohistory-oahp.org/programareas/register

3.2.3 Traditional Cultural Properties

3.2.3.1 Description

A traditional cultural property (TCP) is defined as a property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. In most cases, TCPs are associated with American Indians but may also be associated with other sociocultural or ethnic groups. TCPs may be difficult to recognize and may include a location of a traditional ceremonial location, a mountaintop, a lake, or a stretch of river, or culturally important neighborhood (U.S. Department of the Interior 1998).

3.2.3.2 Affected Environment

There are two Federally recognized tribal entities in the State of Colorado, with whom TCPs may have National Register significance. It should be noted that TCPs that may be of significance to tribal entities may be located at any given location in Colorado, and not necessarily on a reservation. These tribal entities consist of (FR 2002):

1. Southern Ute Indian Tribe of the Southern Ute Reservation, Colorado; and
2. Ute Mountain Tribe of the Ute Mountain Reservation, Colorado, New Mexico and Utah

3.3 Water Resources

For this analysis, water resources include surface water, groundwater/aquifers, wetlands (including playa lakes), and floodplains. The Clean Water Act, the Safe Drinking Water Act, and the Water Quality Act are the primary Federal laws that protect the nation's waters including lakes, rivers, aquifers, and wetlands. In addition, the states of Colorado, Kansas, and Nebraska are party the Republican River Compact, which governs the use of waters of the Republican River and its tributaries.

3.3.1 Surface Water

3.3.1.1 Description

Surface water includes streams, rivers, and reservoirs. Impaired waters are defined by EPA as those surface waters with levels of pollutants that exceed State water quality standards (EPA 2006b). Every two years, States must publish lists, called the 303(d) lists, of those rivers, streams and lakes that do no meet their designated uses because of excess pollutants.

3.3.1.2 Affected Environment

Surface water resources in the Republican River Basin and High Plains CREP area are important for reasons including agriculture, recreation, fish and wildlife. The major surface waters in the area include Frenchman Creek and its tributaries, the North Fork of the Republican River, the South Fork of the Republican River and its tributaries, and the Arikarre River and its tributaries. These rivers flow in a generally eastern direction into the Republican River, which flows through Nebraska and Kansas and eventually joins the Missouri River (Figure 3-1). The entire Republican River Basin encompasses approximately 24,900 square miles.

Surface water diversions totaling approximately 20,000 acre-feet are used for irrigation and to fill Bonny Reservoir. The Bonny Reservoir is on the South Fork of the Republican River near Hale, Colorado just west of the Kansas border in Yuma County. Inflows are from the South Fork of the Republican River and Landsman Creek. Water stored in Bonny Reservoir is available for delivery to 700 acres. Its current storage is 12,372 acre-feet. The reservoir has lost storage water over the past decade and is well below the mean of 34,887 acre-feet (for the years 1951 to 2006; USBR 2006).

An acre-foot is the quantity of water required to cover an acre of land to the depth of one foot. It is equivalent to 43,560 cubic feet.

One river within the Republican River Basin CREP area, Sand Creek, is on the State's list of impaired waters and one river, the North Fork of the Republican River, is on the State's monitoring and evaluation list (Colorado Department of Public Health and Environment [CDPHE] 2004). The Monitoring and Evaluation List includes waterbodies for which information suggests impairment, but supporting documentation does not meet the standards for credible evidence. Sand Creek exceeds State water quality standards for sediment and Escherichia coli (E. coli). The North Fork of the Republican River has high levels of sediment and low aquatic life use.

Concentrated animal feeding operations (CAFO) are large livestock operations that are required to hold permits, file annual reports, and follow plans for handling wastes and wastewater. Approximately 130 CAFOs are in the Republican River Basin and 111 are in the High Plains CREP areas. Cattle feedlots account for the largest percent of all CAFOs in Colorado, followed by dairies and hog farms (Carlson and Leeper 2004). CAFOs can be a major source of nitrogen, phosphorus, and organic pollution to both surface and groundwater if runoff from the lot is not controlled.

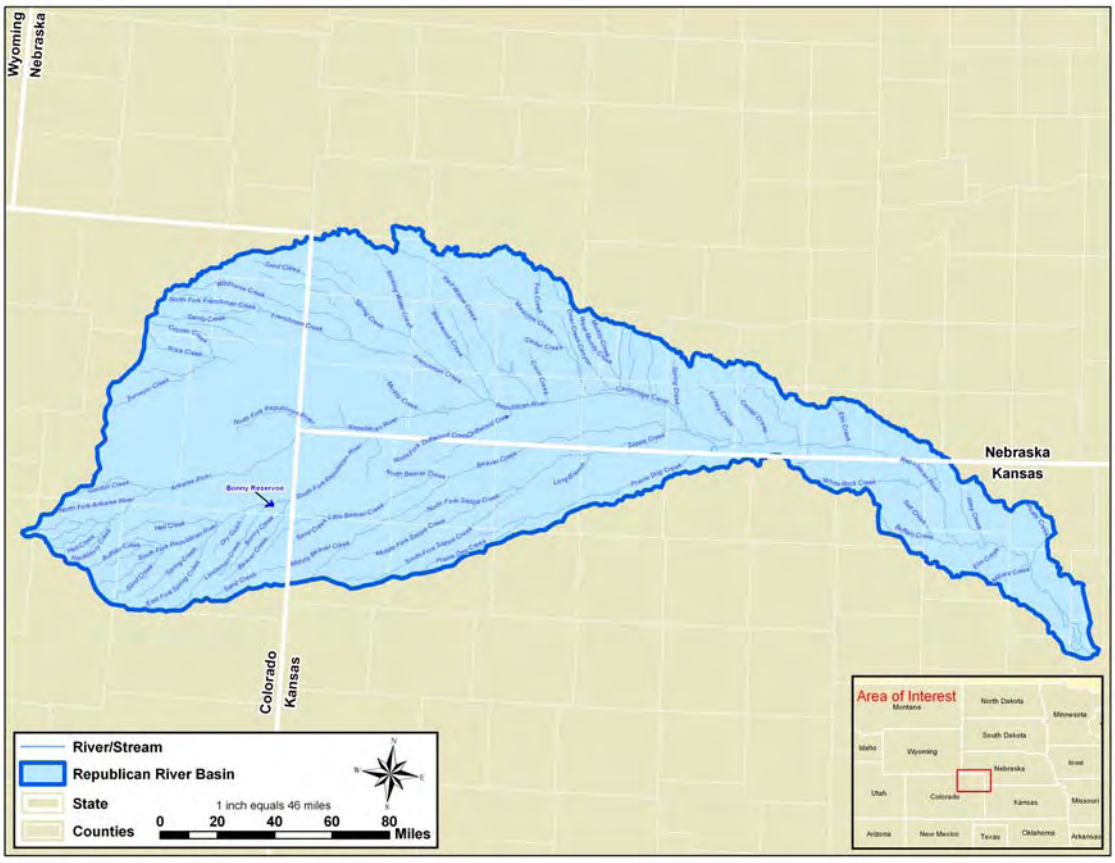


Figure 3.1 Republican River Watershed

3.3.2 Groundwater/Aquifer

3.3.2.1 Description

Groundwater refers to subsurface hydrologic resources that are used for domestic, agricultural, and industrial purposes.

3.3.2.2 Affected Environment

Groundwater in the Republican River Basin is contained in the High Plains Aquifer system (also called the Ogallala Aquifer), which underlies 174,000 square miles in parts of eight States (Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming) and is the largest aquifer system in the United States. The Ogallala Formation underlies about 80 percent of the High Plains Aquifer, including the proposed Republican River and High Plains CREP areas. The Ogallala Formation generally consists of unconsolidated and poorly sorted sequence of gravel, sand, silt, and clay (U.S. Geological Survey [USGS] 2006a).

The Ogallala Aquifer is present in east and northeast portions of Colorado, underlying approximately 14,900 square miles or 14 percent of the State (USGS 2006b). It is the sole source of water for that region (CDPHE 2006). However, it is not an EPA-designated sole source aquifer (EPA 2006a) and does not receive protection under the sole sources aquifer program.

Recharge in the Ogallala Aquifer of eastern Colorado is primarily derived from infiltration of precipitation or seepage from intermittent surface flow in streams. Discharge is primarily from ground-water withdrawals for irrigation, but also includes evapotranspiration, where the water table is near land surface, and seepage to streams and springs where the water table intersects the land surface.

Because of concerns over increases in groundwater withdrawals, the USGS has been analyzing data from over 7,000 groundwater wells in the Ogallala Aquifer since 1988 (USGS 2006d). The data indicate reductions in water levels and the saturated thickness of the Ogallala Aquifer have occurred since the development of modern irrigation techniques in the 1950s. Nearly 4,000 groundwater wells are currently located within the Colorado portion of the Republican River Basin. From 1951 to 2003, the annual acreage of irrigated crop land increased from 41,712 to 561,271 acres and groundwater pumping increased from approximately 13,380 acre-feet to 890,480 acre-feet (Republican River Compact Ground Water Modeling Committee 2003). Water level declines of up to 50 feet have occurred in the Republican River Basin (USGS 2006d).

The saturated thickness of the Ogallala Aquifer ranges from zero along the western edge of the aquifer in Colorado where the aquifer outcrops, to approximately 1,000 feet in west-central Nebraska (USGS 2006c). The saturated thickness in the Republican River Basin area in eastern Colorado is about 400 feet (USGS 2006a). A reduction of X to X percent saturated thickness has occurred since the 1950s. In 2003, total water in storage of the aquifer was about 2,940 million acre-feet which is a decline of about 235 million acre-feet since predevelopment (USGS 2006d). An acre-foot is the quantity of water required to cover an acre of land to the depth of one foot. It is equivalent to 43,560 cubic feet.

The quality of water in the Ogallala Aquifer generally is suitable for irrigation use but, in many places, the water does not meet EPA drinking-water standards with respect to several dissolved constituents (dissolved solids/salinity, fluoride, chloride, and sulfate) (USGS 2006b). Nearly 10 percent of wells sampled from 1992-2001 in the Republican River Basin failed to meet EPA drinking water standards for nitrate content (State of Colorado 2005).

3.3.3 Wetlands

3.3.3.1 Description

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) as areas that are characterized by a prevalence of vegetation adapted to saturated soil conditions. Wetlands can be associated with groundwater or surface water and are identified based on specific soil, hydrology, and vegetation criteria defined by USACE (USACE 1987).

3.3.3.2 Affected Environment

Riparian wetlands and playa lakes are the two major types of wetlands that occur in the Republican River Basin and High Plains CREP areas (Table 3.4). Riparian wetlands are associated with moving water and are seasonally flooded. They generally occur as complexes of forested and emergent wetlands that are interspersed with uplands. The CDOW has identified and mapped approximately 7,000 acres of riparian wetlands in the proposed CREP areas (Table 3.7).

Playa lakes or wetlands are shallow, depressional wetlands that hold water following rainstorms but eventually dry up, resulting in temporary wetlands. They are generally round and average about 17 acres in size. Open water or wet meadow communities can occur in playa lakes. The

Rocky Mountain Bird Observatory has identified approximately 3,350 acres of playa wetlands in the proposed CREP areas.

Table 3.4 County Wetland Acreages.

County	RiparianWetlands (Acres)	Playa Wetlands (Acres)
Kit Carson	700	1,450
Logan	2,500	610
Phillips	300	180
Sedgwick	2,000	500
Yuma	1,500	610
Total	7,000	3,350

Source: State of Colorado 2005.

3.3.4 Floodplains

3.3.4.1 Description

EO 11988, Floodplain Management, addresses concerns over the potential loss of the natural and beneficial functions of floodplains. Federal agencies are required to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development. For this analysis, floodplains are defined as 100-year floodplains, designated by the Federal Emergency Management Agency (FEMA) as those low lying areas that are subject to inundation by a 100-year flood, a flood that has a 1 percent chance of being equaled or exceeded in any given year.

3.3.4.2 Affected Environment

In accordance with EO 11988, Federal agencies must review FEMA flood insurance rate maps (FIRMs) or other available floodplain maps to determine whether a proposed action is located in or will impact 100-year floodplains. FIRMs are generally developed for developed and densely populated areas with flood potential and are not available for much of the CREP area. Currently all of Logan and Yuma counties and several larger towns in Kit Carson, Phillips, Washington, and Lincoln counties are mapped (FEMA 2006). Additional floodplain studies and maps of the seven counties in the proposed CREP project areas may be available the Colorado Water Conservation Board (2006) or town planning offices. Few areas, however, currently have maps available in digital format. Soil survey maps, aerial photography, and topographical maps may also be consulted where no floodplain maps are available.

Rivers in the Republican River Basin arise on the high plains of eastern Colorado. Flooding is seasonal and is generally initiated by heavy spring and summer rain events. Prior to European settlement in Colorado, the plains rivers had strongly varying flow during each year, with very little discharge during the dry times of the year and large floods in late spring and summer. Stream channels and floodplains were broad and sandy, with low banks, sparse woody vegetation, and many smaller channels between shifting sand bars. Since intensive settlement of the region, land use practices such as water diversions and flow regulation have altered the water flow and

floodplains. These changes have resulted in, reduced seasonal flood peaks and increase dry season base flow in the channels. Stream channels have been deepened and flood plains , deepened channels which has facilitated the growth of riparian vegetation. As the vegetation along the channel banks grew thicker and erosive floods decreased, more sediment moving along the channel was trapped on the banks, and the channels and floodplains gradually became narrower.

3.4 Soil Resources

3.4.1 Description

For this analysis, soil resources are defined as topography and soils. Topography describes the elevation and slope of the terrain, as well as other visible land features. Soils are assigned to taxonomic groups and can be further classified by association.

3.4.2 Affected Environment

Topography

Northeastern Colorado is in the Great Plains – Palouse Dry Steppe Province characterized by level to moderately sloped land (Bailey 1995), resulting from the underlying Ogallala Formation (North Plains Groundwater Conservation District [NPGCD] 2006). This formation from the Miocene era spreads from southern South Dakota to northern Texas and is the result of the gradual uplift of the Rocky Mountains and resulting drainage. As the high plains rose, the accumulation of alluvial sediments slowed and eolian and alluvial erosion began. The resulting semi-consolidated bedrock is overlain in most areas by more recent eolian and alluvial deposits (NPGCD 2006).

Soils

Soil orders represented in the region include Alfisols, Entisols, and Mollisols (Bailey 1995). These are mild forest, recently eroded, and grassland soils respectively. Soils series in this region are variable and represent the region's alluvial and eolian erosion history. The CREP counties contain shallow to deep, well-drained to poorly drained soils on level to steep slopes. The region is dominated by a windblown loess cap over sedimentary bedrock. There are lower areas of accumulated alluvial sediments and upland areas with exposed bedrock (Natural Resource Conservation Service [NRCS] 2002, NRCS 2003).

Three soils dominate the CREP region. They are Kuma amd Rago loams, and Valent sands. Kuma is a very deep, well drained loess soil occurring on flat or rolling ground. Rago is a deep, well drained alluvial and eolian soil that is found in flats and depressions. These loamy soils tend to be very productive for agriculture. Valent sand is deep and excessively well drained, formed of eolian sand and found in gently sloping or steep hills, and is relatively less productive than loamy soils (NRCS 2002, NRCS 2003).

3.5 Recreation

3.5.1 Description

Recreational resources are those activities or settings either natural or manmade that are designated or available for recreational use by the public. In this analysis, recreational resources include lands and waters utilized by the public for hunting, fishing, and wildlife viewing.

3.5.2 Affected Environment

Inclusion of the proposed counties in CREP will impact the land and waterways within the project area as well as waters downstream. Because the lands that could be enrolled in the CREP are privately held, landowners control access to these lands for recreational activities. Colorado has a Walk-In Access Program in which private landowners can volunteer to allow small game hunting access on their property during specified periods of the year (Figure 3.2).

Numerous public lands are available for recreation in the proposed CREP area. Within the proposed counties there are 21 State Wildlife Areas encompassing 37,299 acres, two State Parks encompassing 13,032 acres, and five State Trust Lands encompassing 4,174 acres (CDOW 2005d, CSP 2006, CDOW 2005c). Most, if not all of these public lands provide recreational activities such as hunting, fishing, wildlife viewing, camping, hiking, and water sports.

Figure 3.2 Walk-In Access Location Adjoining CRP Area.

The State Wildlife Areas permit hunting for deer, rabbit, pheasant, dove, squirrel, turkey, quail, waterfowl, antelope, coyote, snipe, and furbearers (CDOW 2005d). State Wildlife Areas also permit fishing in warm water lakes and cold water streams and lakes. Warm water fish species include largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), walleye (*Stizostedion vitreum*), channel catfish (*Ictalurus punctatus*), northern pike (*Esox lucius*), white bass (*Morone chrysops*), wiper (hybrid - *Morone chrysops* x *Morone saxatilis*), bluegill (*Lepomis macrochirus*), yellow perch (*Perca flavescens*), and grass carp (*Ctenopharyngodon idella*). Cold water fish include brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), kokanee salmon (*Oncorhynchus nerka*), lake trout (*Salvelinus namaycush*), and rainbow trout (*Oncorhynchus mykiss*; CDOW 2005b).

The State Parks permit hunting for both small and big game (CSP 2006). Warm water fishing is permitted and includes walleye, northern pike, freshwater drum (*Aplodinotus grunniens*), white bass, wiper, black crappie, bluegill, and channel catfish. Because State Trust Lands are held in trust, they are virtually private lands. However, the Public Access Program, a leasing agreement between the CDOW and the State Land Board, makes these lands available for a limited time during the year for hunting, fishing, and wildlife viewing (CDOW 2005e). On State Trust Lands hunting is permitted for deer, pheasant, quail, turkey, ducks, geese, rabbit, squirrel, dove, coyote, furbearers, and big game (CDOW 2005c).

Historically, grasslands dominated the proposed CREP lands (State of Colorado 2005a). Agriculture initially had a positive impact on wildlife by creating a mix of grassland and small patches of agriculture. However, as agriculture intensified and the grassland habitat became more fragmented many populations of wildlife species dependent on riparian and upland grassland ecosystems in the area began to decline. Two economically important species, which have experienced population declines include Ring-necked Pheasant and Greater Prairie-chicken. Ring-necked Pheasant provides an economic benefit through hunting while Greater Prairie-chickens and other ground nesting birds are important as a viewable resource.


Bobwhite Quail

Due to the decline of economically important species within the counties in the proposed CREP area the revenue of the communities within those counties has also declined (Pickton and Sikorowski 2004, State of Colorado 2005a). In 1996, direct expenditures for small game hunting and all wildlife expenditures were estimated $7.5 and $14.5 million, respectively. By 2002, those estimates had declined dramatically to $3.5 and $11.2 million, respectively (Pickton and Sikorowski 2004). These declines have been principally attributed to the decline of pheasant populations (State of Colorado 2005a).

3.6 Socioeconomics

3.6.1 Description

For this analysis, socioeconomics includes investigations of farm and non-farm employment and income, farm production expenses and returns, and agricultural land use. The region of influence (ROI) for analysis of impacts to socioeconomics is those counties where lands eligible for enrollment in the proposed CREP are located, namely, Kit Carson, Logan, Phillips, Sedgewick, and Yuma Counties.

3.6.2 Affected Environment

3.6.2.1 Non-Farm Employment and Income

The 1990 and 2000 civilian labor force within the ROI grew from 19,624 in 1990 to 21,809 in 2000 (United States Census Bureau 1990, USCB 2003). Non-agricultural industries employed 15,798 and 17,908 persons in 1990 and 2000 respectively (USCB 1990, USCB 2003). The unemployment rate within the ROI in 2004 was fairly uniform, ranging between 3.5 percent in Sedgewick and Yuma Counties and 4.4 percent in Logan County (Colorado Department of Labor and employment [CDLE] 2004). In 1989, median household income ranged between $19,335 in

Sedgewick County to $23,125 in Kit Carson County. In 1999, Yuma County enjoyed the highest median household income at $39,814 and Phillips County was at the lower end of the range at $32,177. (USCB 2003).

3.6.2.2 Farm Employment and Income

In 2002, there were 4,397 farm workers on 1020 farms within the region accounting for a payroll of $51,242,000 million (USDA 2002). Table 3.5 lists the hired farm and contract labor costs per county within the ROI and labor costs as a percentage of total production costs. In 2002, 2,540 farms within the ROI had sales less than $250,000 classifying them as small farms, while 454 large farms had sales greater than $250,000 (USDA 2002). Realized net farm income was in excess of $87.8 million in 2002 (USDA 2002). Total government payments to farms within the ROI exceeded $35.4 million in 2002, an increase of $933,000 (2.7 percent) over the 1997 government payments to farms within the ROI (USDA 1997).

Table 3.5 Farm Labor as a Percentage of Total Production Expenses

Area	2002				1997			
	Hired Farm Labor ($000)	Contract Labor ($000)	Total Production Expenses ($000)	Labor as a Percent of Total Production Expenses	Hired Farm Labor ($000)	Contract Labor ($000)	Total Production Expenses ($000)	Labor as a Percent of Total Production Expenses
Kit Carson	8,561	789	217,385	4.30%	5,807	607	153,272	4.18%
Logan	9,515	745	354,792	2.89%	6,991	506	244,533	3.07%
Phillips	4,814	492	83,394	6.36%	5,298	272	102,373	5.44%
Sedgewick	4,376	332	52,806	8.92%	3,858	589	43,886	10.13%
Yuma	23,976	1,150	503,103	4.99%	15,368	862	449,322	3.61%
Total	*51,242*	3,508	*1,211,480*	*4.52%*	*37,322*	2,836	*993,386*	*4.04%*

Source: USDA 2002

3.6.2.3 Farm Production Expenses and Returns

In 2002, farm production expenses exceeded $1.2 billion within the ROI an increase of nearly 22 percent over 1997 (USDA 2002). Using the 2002 acreage in active farm production (4,457,406 acres), the average cost per acre within the ROI in 1997 was $271.79 (USDA 2002). Using 2002 cropland, the cost per acre of agricultural chemicals inputs, including fertilizers and lime, was $13.11 (USDA 2002). Average net cash income from operations within the ROI was $29,216 per farm in 2002 (USDA 2002). Table 3.6 lists the average farm production expenses and return per dollar of expenditure from 1997 within each of the counties within the ROI. Table 3.7 lists the average value of land and buildings and the average value of machinery and equipment per farm within each of the counties within the ROI.

Table 3.6 Average Farm Production Expense and Return Per Dollar of Expenditure (2002)

Area	Average Size of Farm (acres)	Average Total Farm Production Expense ($)	Average Cost Per Acre ($)	Average Net Cash Income/Farm ($)	Average Net Cash Income/Acre ($)	Average % Return / $ Expenditure
Kit Carson	1,840	321,000	174	5,003	2.72	0.02
Logan	1,195	234,000	196	5,408	4.53	0.02
Phillips	1,410	651,000	462	39,859	28.28	0.06
Sedgewick	1,459	1,156,000	793	41,043	28.14	0.04
Yuma	1,567	252,000	161	67,156	42.85	0.27
ROI	1,494.2	523,000	357	29,216	19.62	0.06

Source: USDA 2002

Table 3.7 Average Value per Farm of Land and Buildings and Machinery and Equipment

Area	Average Size of Farm (acres)	Average Value of Land & Buildings ($ per farm)	Average Value of Machinery & Equipment ($ per farm)
Kit Carson	1,840	815,335	162,267
Logan	1,195	643,347	132,355
Phillips	1,410	967,807	194,227
Sedgewick	1,459	994,695	184,763
Yuma	1,567	852,401	164,743

Source: USDA 1999

3.6.2.4 Current Agricultural Land Use Conditions

In 1997, 1.70 million acres of land within the ROI were actively used for agricultural purposes including cropland, hay land, and pastureland, this was an increase of approximately 2.8 percent from the 1992 figures (1.65 million acres) (USDA 1999). Table 3.8 lists the acreage for different agricultural land uses in 1992 and 1997 and the percent change during the period. Active conservation programs acreage for all program years (1986-2005) included 111,015 acres (active CRP), 5,638 acres (continuous non-CREP), 17,533 acres (Wetland Reserve Program [WRP]), 252 acres (marginal pastures), and 85,466 acres (tree practices) within the ROI.

Table 3.8 Agricultural Land Use Acreage within the ROI

Land Use	2002 Acreage	1997 Acreage	Percent Change
Cropland[1]	2,696,305	2,665,008	1.17
Hay land[2]	111,000	108,498	2.31
Pastureland[3]	1,677,178	1,865,857	(10.11)
Woodland[4]	3,631	1,793	102.51
House lots, ponds, roads, wasteland, etc.	80,292	88,626	(9.40)
CRP & WRP[5]	303,733	283,837	7.01
Active Agriculture[6]	4,484,483	4,639,363	(3.34)
Total Land in Farms[7]	4,457,406	4,597,224	(3.04)

1 Cropland excludes all harvested hayland and cropland used for pasture or grazing
2 Hay land includes all harvested cropland used for alfalfa, other tame, small grain, wild, grass silage, green chop, etc.
3 Pastureland includes all pasture, including cropland, grazed woodland, and rangeland not considered cropland or woodland
4 Woodland excludes all wooded pasture lands
5 CRP & WRP acreages are included as active agricultural lands
6 Active agricultural lands include the sum of cropland, hay land, and pastureland
7 Total land in farms include the sum of cropland, hay land, pastureland, woodland, and house lots, etc.
Source: USDA 2002

3.7 Environmental Justice

3.7.1 Description

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires a Federal agency to "make achieving environmental justice part of its mission by identifying and addressing as appropriate, disproportionately high human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." A minority population can be defined by race, by ethnicity, or by a combination of the two classifications.

According to CEQ, a minority population can be described as being composed of the following groups: American Indian or Alaska Native, Asian or Pacific Islander, Black, not of Hispanic origin, or Hispanic and exceeding 50 percent of the population in an area or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population (CEQ 1997). The USCB defines ethnicity as either being of Hispanic origin or not being of Hispanic origin. Hispanic origin is further defined as "a person of Cuban, Mexican, Puerto Rican, South or Central America, or other Spanish culture or origin regardless of race" (USCB 2001).

Each year the USCB defines the national poverty thresholds, which are measured in terms of household income and are dependent upon the number of persons within the household. Individuals falling below the poverty threshold are considered low-income individuals. USCB census tracts where at least 20 percent of the residents are considered poor are known as poverty areas (USCB 1995). When the percentage of residents considered poor is greater than 40 percent, the census tract is considered an extreme poverty area.

3.7.2 Affected Environment

3.7.2.1 Demographic Profile

The total population within the ROI was 45,583 persons in 2000, which was an approximately 12.4 percent increase over the population of 1990 (USCB 1993, 2003). Approximately one-third of the population (34.7 percent) was located within urban areas or urban clusters (USCB 2003). Only 1825 persons (4 percent of the total population) resided on farms. This was a decrease of approximately 64.3 percent from the 1990 farm population (USCB 1993).

Demographically the ROI population was 91.4 percent White, non-Hispanic; 1.3 percent Black or African American, non-Hispanic; 0.5 percent Native American or Alaska Native, non-Hispanic; 0.3 percent Asian, non-Hispanic; 0.05 percent Native Hawaiian or Pacific Islander, non-Hispanic; 1.3 percent all other races or combination of races, non-Hispanic; and 12.4 percent Hispanic (USCB 2003). The total minority population within the ROI was 3878 persons or 8.51 percent of the total ROI population (USCB 2003). The ROI is not a location of a concentrated minority population.

In 2002, there were 50,187 farm operators running 31,050 farms in Colorado; of these, Hispanics operated 66 farms within the ROI; Black or African Americans operated 0 farms; and Native Americans operated 12 farms (USDA 2002). The ROI accounts for 4.6 percent of all minority farm operators within the State of Colorado, while these 78 farms account for 0.5 percent of the total number of farms within the ROI (USDA 2002).

3.7.2.2 Income and Poverty

In 1989, median household income ranged between $19,335 in Sedgewick County to $23,125 in Kit Carson County. In 1999, Yuma County enjoyed the highest median household income at $39,814 and Phillips County was at the lower end of the range at $32,177. (USCB 2003). The household poverty rate in the ROI ranged from 9.4 percent (Kit Carson County) to 8.8 percent (Phillips and Yuma Counties) in 2000 (USCB 2003). None of the counties within the ROI would be considered poverty or high poverty areas.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Biological Resources

Impacts to biological resources would be considered significant if implementation of the proposed CREP Agreements resulted in reducing the wildlife or fisheries populations to a level of concern, removing land with unique vegetation characteristics, or incidental take of protected species or their habitat.

4.1.1 Wildlife and Fisheries

4.1.1.1 Alternative A – Preferred

Associated with improved habitat conditions, wildlife diversity in the proposed CREP area would increase from implementation of CPs. In comparison to the existing conditions on most of the eligible cropland, wildlife habitat and wildlife diversity would benefit after establishment of each CP. Wildlife would benefit primarily from establishment of permanent wildlife habitat (CP-2 and CP-4D) and wetland and playa lake restoration (CP-23 and CP-23a). Additional habitat is created in the establishment of crosswind traps (CP-24) and filter strips (CP-21). Establishment of riparian buffers (CP-22) would enhance stream corridor quality and important habitat for neo-tropical and other migratory and nesting birds. Grassland and ground-nesting birds such as Ring-necked Pheasant, generally absent from croplands, would benefit primarily from establishment of grasses (CP-2, CP-4D, CP-12 and CP-329a) and adjacent EQIP acres (High Plains Region only).

Increased wildlife populations, especially game birds and deer, could enhance the socioeconomic value of agricultural lands for hunting, wildlife watching, and other outdoor recreational activities (see Section 4.6). However, the benefits would not be realized until a period after implementation of the proposed CREP because of the time required for development of vegetation and travel corridors. Restricting ground and vegetative disturbing CP implementation and maintenance to the periods authorized by CCC would have minimal impacts on nest success.

Agricultural runoff is a leading threat to aquatic biodiversity nationwide (Stein et al. 2000). Sediments and nutrients (mainly nitrogen and phosphorus) are the primary sources of pollutants that combine to lower the water quality for aquatic species. Suspended sediments reduce water clarity and the amount of sunlight that reaches submerged vegetation. Without sunlight, photosynthesis cannot occur in aquatic vegetation and microscopic algae. In turn, the aquatic insects and fish that depend on those organisms and vegetation as a food source suffer thus impacting the entire trophic system. High levels of suspended sediments also destroy spawning sites for aquatic species by covering nests and their eggs. Excess amounts of nitrogen and phosphorus from agricultural runoff can result in poor water quality and aquatic habitat by creating dense blooms of phytoplankton and algae (Welsch 1991). These blooms become so dense that they exclude sunlight and kill submerged aquatic vegetation. The subsequent decomposition by bacteria depletes oxygen, which eventually leads to large-scale fish kills.

Fisheries in the proposed CREP area would benefit from reduced levels of nutrient and sediment loading to surface waters from common agricultural activities. Lower nutrient concentrations in the streams would improve fish and invertebrate community health, as well as stream corridor quality. In particular, establishment of filter strips (CP-21), crosswind traps (CP-24), riparian buffers (CP-22), and wetland restoration (CP-23) would enhance fisheries in the CREP area and downstream. Filter strips and riparian buffers are widely recognized for their value in reducing nonpoint source pollution (Welsch 1991). Wetland restoration creates habitats that are critical for

amphibian reproduction and provide habitat for other aquatic species (EPA 2001). The proposed CPs would remove, sequester, or transform nutrients, sediments, and other pollutants from agricultural runoff by intercepting pollutants before they reach surface waters, increasing infiltration, increasing nutrient uptake by vegetation, and maintaining microbial processes that reduce pollution in water bodies through denitrification (Welsch 1991).

4.1.1.2 Alternative B – No Action

Under the No Action Alternative the proposed CREP would not be implemented. Lands that would have been eligible for enrollment in CREP would remain in agricultural production or would be enrolled in CRP or another conservation program. The continued use of land for agriculture or the conversion of land to another type of agricultural production would increase susceptibility for additional loss of wildlife habitat. Runoff of agricultural chemicals, animal wastes, and sediment would continue to degrade water quality and habitat for native plants and animals.

4.1.2 Vegetation

4.1.2.1 Alternative A – Preferred

Every CP that is proposed for implementation under the Republican River Basin and High Plains Region CREP proposals would contribute to vegetation diversity in the proposed CREP area. In particular, establishment of permanent native grasses (CP-2 and CP-4D) and riparian buffers (CP-22) would benefit vegetation resources in the CREP area. These efforts would stimulate the development of natural vegetative communities in the riparian areas and adjacent uplands.

In addition, establishment of native plant communities would help to reduce occurrences of invasive and exotic plant species. Invasive and exotic plants generally thrive in disturbed areas. Intact natural environments, such as those that would be created under CREP are least vulnerable to non-native species. The monitoring activities conducted as part of each CP contract could include management measures to prevent invasive and exotic plants from reducing the success of planting efforts. Elimination of invasive and exotic plants from project areas would help to ensure that CREP program goals are being cost-effectively accomplished. Vegetation restoration would increase biodiversity and improve water quality throughout the eligible lands proposed for enrollment.

4.1.2.2 Alternative B – No Action

Under the No Action Alternative the proposed CREP would not be implemented. Lands that would have been eligible for enrollment in CREP would remain in agricultural production or would be enrolled in CRP or another conservation program. The continued use of land for agriculture or the conversion of land to another type of agricultural production would increase susceptibility to invasion by exotic species. Agricultural lands that have been farmed for long periods lack the critical components required for regeneration of native communities (seed banks, microorganisms and nutrients). Runoff of agricultural chemicals, animal wastes, and sediment would continue to degrade water quality and therefore habitat for native plants.

4.1.3 Protected Species and Habitat

4.1.3.1 Alternative A – Preferred

Implementation of the proposed CREP would have positive impacts on protected species and their habitats. Benefits to aquatic species in this category would be realized shortly after

implementation of CPs and would increase over the long-term. Benefits to threatened, endangered, and sensitive species in terrestrial environments would be minimal in the short-term but would be realized as vegetative communities develop.

Implementation of the proposed CREP could potentially have positive impacts on the protected species from the establishment of permanent native vegetation through the implementation of certain CPs including native grasses (CP-2 and CP-4D), riparian buffers (CP-22), wildlife food plots (CP-12) crosswind trap strips (CP-24) and restored wetlands and playa lakes (CP-23 and CP-23a). This additional grassland and riparian habitat would benefit protected species such as northern pocket gopher, swift fox, American Peregrine Falcon, Ferruginous Hawk, Plains Sharp-tailed Grouse, common garter snake, massasauga, and midget faded rattlesnake.

Benefits to aquatic species such as brassy minnow, plains minnow, plains orange throat darter, stonecat, suckermouth minnow, yellow mud turtle, northern cricket frog and northern leopard frog would be realized from improved water quality and quantity through the implementation of filter strips (CP-21), riparian buffers (CP-22), and wetlands (CP-23).

There is potential for negative impacts to protected species during activities related to establishing the CPs including grading, leveling, filling, and construction of bridges, fences, and pipelines. Informal consultation with Colorado's Fish and Wildlife Service Ecological Services Field Office is recommended on a case-by-case basis as appropriate, which would be determined after the appropriate level of environmental review is completed.

4.1.3.2 Alternative B – No Action

Under the No Action Alternative the proposed CREP would not be implemented. Lands that would have been eligible for enrollment in CREP would remain in agricultural production or would be enrolled in CRP or another conservation program. The continued use of land for agriculture or the conversion of land to another type of agricultural production would increase susceptibility for additional loss of habitat for protected species. Runoff of agricultural chemicals, animal wastes, and sediment would continue to degrade water quality and therefore eliminate potential habitat for protected species.

4.2 Cultural Resources

An impact would be significant to cultural resources if implementation of the CREP Agreements resulted in:

- the destruction or alteration of all or a contributing part of any National Register-eligible cultural or historic property without prior consultation with the SHPO;
- the isolation of an eligible cultural resource from its surrounding environment;
- the introduction of visual, audible, or atmospheric elements that are out of character with a National Register-eligible site or would alter its setting;
- the neglect and subsequent deterioration of a National Register-eligible site; or
- the disturbance of important sites of religious or TCPs to American Indians.

4.2.1 Archaeological Resources

4.2.1.1 Alternative A – Preferred

Due to the rich cultural and archaeological history of the CREP areas, the potential for encountering archaeological resources during implementation of CREP contracts is considered high. CPs that are ground disturbing beyond what is normally disturbed from agricultural plowing have the potential to impact known and yet unknown archaeological resources. Such practices include earthmoving for installation of filter strips, firebreaks, fencing, and roads, as well as construction of dams, levees, and dikes in wetland restoration areas and excavation of potholes or other structures to regulate water flow.

In order to determine whether proposed ground disturbing practices would impact archaeological resources listed in or eligible for listing in the National Register, an archaeological survey of proposed impact areas would be required prior to implementation of the contracts. The archaeological survey should at a minimum meet survey guidelines set forth by the Colorado OAHP. Results and recommendations from the survey should receive concurrence for the Colorado SHPO prior to project implementation.

4.2.1.2 Alternative B – No Action

Under the No Action Alternative, farming practices in the CREP area would continue. Though the continuation of farming in previously disturbed areas is not expected to impact cultural resources, a change in farming practices that would disturb previously undisturbed areas could result in impacts to known or unknown archaeological, architectural, or traditional cultural resources. Continued use of traditional or deep tillage resulting in erosion could impact cultural resources.

4.2.2 Architectural Resources

4.2.2.1 Alternative A – Preferred

The CREP areas contain an architectural history related to early settlement and heritage themes of Colorado's history. Should proposed CPs include the removal or modification of historic architectural resources, a historic architectural resources survey would be required in order to determine whether such resources are eligible for inclusion in the National Register. Results and recommendations from the survey should receive concurrence from the SHPO prior to project implementation.

4.2.2.2 Alternative B – No Action

Under the No Action Alternative, farming practices in the CREP area would continue. Though the continuation of farming in previously disturbed areas is not expected to impact cultural resources, a change in farming practices that would disturb previously undisturbed areas could result in impacts to known or unknown architectural resources. Continued use of traditional or deep tillage resulting in erosion could impact cultural resources.

4.2.3 Traditional Cultural Properties

4.2.3.1 Alternative A – Preferred

Because the areas of potential effect of CREP actions are not yet defined, no American Indian sacred sites or TCPs are identified. Once these areas are defined, consultation with American

Indian tribes or tribal entities that have traditional ties to the lands may be needed to determine whether such properties exist on affected lands. Federally recognized tribal entities to be contacted may include the:

1. Southern Ute Indian Tribe of the Southern Ute Reservation, Colorado; and
2. Ute Mountain Tribe of the Ute Mountain Reservation, Colorado, New Mexico & Utah (FR 2002).

4.2.3.2 Alternative B – No Action

Under the No Action Alternative, farming practices in the CREP area would continue. Though the continuation of farming in previously disturbed areas is not expected to impact cultural resources, a change in farming practices that would disturb previously undisturbed areas could result in impacts to traditional cultural resources.

4.3 Water Resources

Impacts to water resources would be considered significant if implementation of the proposed CREP Agreements resulted in changes to water quality or supply, threatened or damaged unique hydrologic characteristics, or violated established laws or regulations.

4.3.1 Surface Water

4.3.1.1 Alternative A – Preferred

Implementation of the proposed CREP would have long-term positive effects on surface water quality and quantity. The CPs listed in Section 2.1 are designed to improve water quality. Establishing native grasses (CP-2 and CP-4D) would stabilize soils and reduce soil erosion and the runoff of nutrients and chemicals associated with agriculture. The establishment of filter strips (CP-21) and riparian buffers (CP-22) installed adjacent to watercourses would stabilize stream banks and provide areas for the retention of sediment and nutrient runoff from adjacent lands. Additionally, a reduction in the use of fertilizers and pesticides should occur as a result of the shift in land use from production to conservation, and resulting in reductions of nitrogen, phosphorous, and other agricultural chemicals in runoff.

Implementation of the proposed Republican River CREP Agreement would also increase streamflow assuming 5 percent of the 30,000 acres of enrolled cropland are irrigated by surface water; annual increases of up to 2,250 acre-feet are expected (State of Colorado 2005b).

Activities such as vegetation clearing and soil disturbance may occur during the installation of CPs. These activities could result in temporary and minor localized negative impacts to surface water quality from runoff associated with these activities. The use of filter fencing or similar best management practices would reduce or eliminate these impacts.

4.3.1.2 Alternative B – No Action

Under the No Action Alternative, the CPs described in Section 2.1 would not be implemented. The use of land for agriculture or conversion of lands to other types of agricultural production could result in the continued degradation of water quality from runoff of agricultural chemicals, animal waste, and sediment. Surface water diversions for agricultural purposes would continue to reduce stream flow in affected rivers.

4.3.2 Groundwater/Aquifer

4.3.2.1 Alternative A – Preferred

Implementation of the proposed CREP Agreements would result in positive effects on groundwater quality and quantity. Reductions in nitrogen and phosphorous fertilizers are expected to occur as a result of the Proposed Action. Table 4.1 illustrates the reduction in fertilizer use on croplands within the Republican River CREP area. Table 4.2 illustrates reductions of fertilizer use on 30,000 acres in the High Plains CREP area. The estimated reduction in crop acreage is based on data provided by the Colorado Agricultural Statistics Bulletin (Colorado Department of Agriculture 2004).

Table 4.1 Estimated Annual Reduction in Fertilizer Use Under the Republican River CREP.

Crops	CREP Acres[1]	Application Rate (lb/ac)		Reduction in Application (lbs)	
		N	P	N	P
Dry Beans	1,522	75	15	114,150	22,830
Corn	21,298	200	30	4,259,600	638,940
Hay	4,205	20	5	84,100	21,025
Sugarbeets	791	140	35	110,740	27,685
Irrigated Wheat	2,184	100	30	218,400	65,520
Dryland Wheat[2]	5,000	40	20	200,000	100,000
Total	**35,000**			**4,986,990**	**876,000**

[1]Based on current crop allocation from 2004 Colorado Agricultural Statistics bulletin applied to 30,000 acre reduction.
[2]Based on an estimated reduction of 5,000 acres of dryland wheat production.

Table 4.2 Estimated Annual Reduction in Fertilizer Use Under the High Plains CREP.

Crop	CREP Acres[1]	Application Rate (lb/ac)		Reduction in Application (lbs)	
		N	P	N	P
Dryland Wheat	30,000	40	20	1,200,000	600,000

[1]Based on current crop allocation from 2004 Colorado Agricultural Statistics bulletin applied to 30,000 acre enrollment.

Implementation of the proposed CREP Agreements would further improve groundwater quality in the Republican River and High Plains CREP areas through reduction in the use of agricultural pesticides. Although pesticide use may vary widely for each crop produced in the Republican River CREP area, an estimate in the reduction of pesticide use on the primary crops (corn and wheat) can be made based on typical agricultural practices. Irrigated corn may typically be treated with Atrazine, Roundup, and Lorsban whereas wheat may be treated with Roundup, Ally, and Banvel. Estimated reductions in pesticide applications expected through reductions in irrigated corn, and irrigated and dryland wheat cropland under the Republican River CREP Agreement are shown in Table 4.3.

Table 4.3 Estimated Annual Reduction of Pesticides Under the Republican River CREP.

Pesticide	Irrigated Acres[1]	Dryland Acres[2]	Application Rate (lb/ac)	Reduction in Application (lbs)
Corn				
Atrazine	21,298		0.50	4,345
Roundup	21,298		3.25	33,7792
Lorsban	21,298		1.5	4,792
Wheat				
Roundup	2,184	5,000	4.88	17,091
Ally	2,184	5,000	0.01	64
Banvel	2,184	5,000	0.25	866

[1]Based on current crop allocation from 2004 Colorado Agricultural Statistics bulletin applied to 30,000 acre reduction.

[2]Based on an estimated reduction of 5,000 acres of dryland wheat production.

Estimated reductions in pesticide use under the High Plains CREP Agreement would include reductions on 30,000 acres of dryland winter wheat and 69,000 acres that would continue to be managed under a DMT system under EQIP. Table 4.4 illustrates these estimated pesticide reductions.

Table 4.4 Estimated Annual Reduction of Pesticides Under the High Plains CREP.

Pesticide	CREP Acres	EQIP Acres[1]	Application Rate (lb/ac)	Reduction in Application (lbs)
Atrazine	30,000	34,500	0.50	32,250
Roundup	30,000	34,500	4.88	314,760
Ally	30,000	34,500	0.01	645
Banvel	30,000	34,500	0.25	16,125

[1]For the purpose of calculating pesticide application on EQIP acres, a two year fallow crop rotation is used; therefore half of the total 69,000 acreage is shown.

Implementation of the proposed Republican River CREP would reduce depletions to the Ogallala Aquifer. Annual reductions of up to 45,699 acre-feet from the current rate (890,480 acre-feet) are expected, assuming 95 percent of the 30,000 acres of enrolled cropland are irrigated by groundwater pumping.

4.3.2.2 Alternative B – No Action

Under the No Action Alternative, the CPs described in Section 2.1 would not be implemented. The use of land for agriculture or conversion of lands to other types of agricultural production could result in the continued degradation of water quality from fertilizers and agricultural chemicals. No additional reduction in the decline of the groundwater level in the Ogallala Aquifer would occur.

4.3.3 Wetlands

4.3.3.1 Alternative A – Preferred

Implementation of the proposed CP-23 (Wetland Restoration), CP-23a (Playa Lakes Restoration), and CP-22 (Riparian Buffer) is expected to restore or enhance the acreage of wetlands and riparian habitat in the proposed CREP area by as much as 500 acres. The positive impacts of restoring wetlands and riparian areas on wildlife and aquatic species are discussed in Section 4.2, Biological Resources.

4.3.3.2 Alternative B – No Action

Under Alternative B, the No Action Alternative, the CPs described in Section 2.1 would not be implemented and no change to existing wetland acreage would occur. Continued runoff of agricultural chemicals, erosion of soils, and the impacts to wetlands would be expected if the No Action Alternative were implemented.

4.3.4 Floodplains

4.3.4.1 Alternative A – Preferred

Implementation of Alternative A would result in positive effects to floodplains. Minor improvements in floodplain areas and stream profiles would occur from implementation of CP-21, CP-22, CP-23 and CP-23a would increase floodwater storage capacity through wetland restoration, stabilize floodplains, and improve habitat through restorative plantings, and install structures within existing floodplains. CPs that involve construction activities, substantial earth movement, diking, or other means of altering the flowage area would need to be reviewed and appropriate public notice provided. Applicable development permits must be obtained from local authorities prior to construction activities within a floodplain.

4.3.4.2 Alternative B – No Action

Implementation of Alternative B would have no beneficial effect on floodplains. Under this alternative, the CPs described in Section 2.1 that would have beneficial effects on floodplain conditions would not be implemented.

4.4 Soil Resources

Impacts to soil resources would be considered significant if implementation of the proposed CREP Agreements resulted in increased erosion and sedimentation, or affected topographical or unique soil conditions.

4.4.1 Alternative A – Preferred

Under Alternative A, long-term positive impacts to soil resources are expected to occur with the implementation of the proposed CPs resulting in localized stabilization of soils and topography as a result of increased soil moisture, reduced erosion and runoff. Restoration of riparian areas will reduce stream bank destabilization, resulting in reduced rates of sedimentation and subsequent improvements to water quality (see Section 4.3 for a discussion of surface water quality). Establishing permanent vegetation on former croplands would reduce wind and water erosion commonly associated with bare land in that region. Short-term disturbance to soils during

implementation of CPs could include tilling, or installation of various structures such as fences, breakwaters and roads. These activities may result in temporary minor increases in soil erosion.

4.4.2 Alternative B – No Action

Under Alternative B the CPs would not be implemented and the benefits discussed above would not occur. Erosion of soils by wind and water is expected to continue on lands that remain in production.

4.5 Recreation

Impacts to recreation would be considered significant if they drastically increased, reduced or removed available public lands designated for recreation or significantly degraded other aspects of recreation. Impacts to environmental conditions such as air, water, or biological resources within or near public recreational land in such a way to affect its use would also be considered significant.

4.5.1 Alternative A – Preferred

Implementation of Alternative A would have a positive long-term impact on recreational resources by increasing hunting, fishing and watchable wildlife species. Installation of the proposed CPs would increase wildlife habitat and the abundance of wildlife species including white-tailed deer, Ring-necked Pheasant, and Greater Prairie-chicken. All enrolled land would be concurrently enrolled into the Walk-In Access Program thus increasing landowner income and available hunting acres. An increase in water quality and quantity would allow for an improvement in habitat conditions for aquatic species that in turn will increase populations of game fish. A short-term negative impact to recreational activities may occur during the installation of the proposed CPs due to unsightly construction activities or displacement of game species.

An estimated 1.3 percent increase for hunting and fishing expenditures and wildlife viewing expenditures is expected within the five counties in the proposal area if all CPs are initiated (Davis 2005). This would result in an approximate $258,000 increase from 2002 in total expenditures for hunting and fishing and an approximate $952,900 increase from 2002 in total expenditures for wildlife viewing. The increased revenue is estimated to support an additional 3.5 jobs related to hunting and fishing and 13.1 jobs related to wildlife viewing in the five counties in the proposal area.

4.5.2 Alternative B – No Action

Under Alternative B the CPs described in Section 2.1 would not be implemented and no change to existing recreational activities would occur. Continued fragmentation of wildlife habitat would be expected, resulting in continued declines of populations of game and watchable wildlife species of birds, fish, and mammals. This in turn would result in continued declines in recreational expenditures. Continued degradation of water quality would be expected, affecting water related recreational opportunities.

4.6 Socioeconomics

Significance of an impact to socioeconomics varies depending on the setting of the Proposed Action, but 40 CFR 1508.8 states that indirect effects may include those that are growth inducing

and others related to induce changes in the pattern of land use, population density, or growth rate. Under CEQ regulations, a socioeconomic impact, in and of itself, does not indicate that preparation of an Environmental Impact Statement (EIS) is warranted. However, a socioeconomic impact can contribute to the overall cumulative impacts of the project. These incremental impacts, which can include socioeconomic, may produce a significant impact and warrant an EIS.

4.6.1 Alternative A - Preferred

Implementing the Proposed Action could produce a slight beneficial impact to the economy of the ROI. The Proposed Action calls for expenditure of $25.7 million for the High Plains CREP and $66.3 million for the Republican River Basin CREP.

For the ROI, the average net cash income was $19.62 in 2002. The sales for fertilizer and chemicals (Chemical Inputs [CI]) averaged $13.11 per acre. The average annual expenditures on labor (hired and contract) averaged $8.37 per acre. The average annual wage for all persons engaged in agricultural employment was $25,137.00 during this period (CDLE 2002).

Absent any payments under the CREP program, the loss of 65,000 acres from production could be anticipated to result in a reduction of $1,275,300 net cash income, a loss of $852,150 in CI not purchased for agricultural use, and $544,000 in labor expense, which equates to approximately 22 jobs at the prevailing wages within the ROI. The 22 jobs represent a small fraction of agricultural employment in the ROI; current estimates indicate that agriculture employs 1,118 persons in the ROI.

However, the inclusion of 65,000 acres in the two CREP programs would result in the expenditure of $25.7 million (High Plains CREP) and $66.3 million (Republican River CREP). As shown in a simplified flowdown model, this results in a net present value of over $26 million for the High Plains CREP and $38.7 million for the Republican River CREP after considering employment loss and reduced sales and purchase of chemical inputs.

4.6.2 Alternative B – No Action

Under the No Action Alternative, the two CREPs would not be implemented within the ROI. Socioeconomic conditions would continue to follow current trends associated with the ROI and northeastern Colorado and surrounding States. Farmland could continue to be sold for development rights; unique and prime farmland areas could continue to be targeted for purchase of conservation easements.

4.7 Environmental Justice

Environmental justice is achieved when everyone, regardless or race, culture, or income, enjoys the same degree of protection from environmental and health hazards and has equal access to the decision-making process. Significant environmental justice impacts would result if access to decision-making documents was denied or if any adverse environmental effects occurred that would disproportionately affect minority or low-income populations.

4.7.1 Alternative A – Preferred

The Republican River Basin and High Plains Region CREP areas are neither areas of concentrated minority populations nor impoverished areas. Therefore no disproportionate impacts to such groups would occur were the Preferred Alternative implemented.

4.7.2 Alternative B – No Action

Under the No Action Alternative, none of the proposed CREP activities would be implemented and no environmental justice impacts would occur.

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5.0 CUMULATIVE EFFECTS

5.1 Introduction

CEQ regulations stipulate that the cumulative effects analysis within a PEA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present and reasonably foreseeable actions regardless of what agency or person undertakes such other actions." CEQ guidance in Considering Cumulative Effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the Proposed Action. The scope must consider geographic and temporal overlaps among the Proposed Action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects most likely arise when a relationship exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated. Similarly, actions that coincide, even partially, in time tend to have potential for cumulative effects.

In this PEA, the affected environment for cumulative impacts is those counties where lands are eligible for enrollment in CREP and EQIP. For the purposes of this analysis, the goals and plans of Federal programs designed to mitigate the risks of degradation of natural resources are the primary sources of information used in identifying past, present, and reasonably foreseeable actions.

5.2 Past, Present, and Reasonably Foreseeable Actions

In addition to CREP, Colorado maintains and implements numerous Federal programs authorized under the Farm Bill to conserve and enhance the natural resources of the area. These programs include, but are not limited to, CRP, Wildlife Habitat Incentives Program (WHIP), EQIP, and the WRP. Additionally, State conservation efforts include agencies and programs such as Cooperative Habitat Improvement Program, Pheasant Habitat Improvement Program, Habitat Partnership Program, Preserving Colorado's Landscapes, Colorado Ground Water Commission, Colorado Division of Water Resources, and Republican River Water Conservation District and Water Activity Enterprise.

Conservation Reserve Program

CRP is the largest private land environmental conservation program. This voluntary program supports the implementation of long-term conservation measures designed to improve the quality of ground and surface waters, control soil erosion, and enhance wildlife habitat on environmentally sensitive agricultural land. Landowners can receive annual rental and maintenance payments, incentive payments, and cost-share support for the establishment of conservation measures. Table 5.1 lists the acres enrolled and available for enrollment in the CRP program as of October 2005.

Table 5.1 CRP Acres Enrolled and Available for Enrollment

County	Acres Enrolled as of October 2005	Acres Available for Enrollment
Kit Carson	233,388	20,241
Logan	132,179	11,422
Phillips	85,648	7,394
Sedgwick	10,504	50,343
Yuma	96,355	87,782
Total	558,074	177,182

Wildlife Habitat Incentives Program

WHIP offers opportunities to private and Tribal landowners to improve and protect wildlife habitat. Through the program, the NRCS provides technical and financial assistance to landowners to develop upland, wetland, riparian, and aquatic habitat areas on their property. Cost sharing reimburses up to 75 percent of costs, not to exceed $15,000 per contract. From 2002 through 2005, 1,379 acres of CREP lands have been enrolled in WHIP (NRCS 2006).

Environmental Quality Incentives Program

EQIP supports production agriculture and environmental quality as compatible goals. The program offers technical and financial assistance to farmers and ranchers who face serious threats to soil, water, and related natural resources. NRCS may pay up to 75 percent of the costs (up to $450,000) of certain CPs such as grassed waterways, filter strips, waste management facilities, grade stabilization structures, and other practices important to improving and maintaining the health of natural resources. EQIP enrollment is reported by watershed. The lands eligible for enrollment in the Republican River Basin and High Plains Region CREP Agreements lie within the EQIP Republican River and Lower South Platte River Watersheds. As of 2003, the Republican River Watershed had 164 EQIP contracts totaling $2,272,600 and the Lower South Platte River Watershed had 129 EQIP contracts totaling $2,166,791(NRCS 2004).

Wetlands Reserve Program

WRP is a voluntary program which provides technical and financial assistance to landowners who enhance wetlands and retire marginal agricultural lands. Under WRP, lands can be enrolled in permanent conservation easements, 30-year conservation easements, or restoration cost-share agreements. NRCS supports 75 to 100 percent of the cost of wetland restoration and easement payments for permanent and 30 year conservation easements. From 1995 through 2005, 3,537 acres of CREP lands have been enrolled in the WRP.

5.3 Cumulative Effects Matrix

The incremental contribution of impacts of the Proposed Action, when considered in combination with other past, present, and reasonably foreseeable actions, is expected to result in positive impacts to water, earth, biological, and recreational resources both in the proposed CREP and in waters downstream. Table 5.2 summarizes cumulative effects.

Table 5.2 Cumulative Effects Matrix

Resource	USDA Programs CRP, WHIP, WRP, EQIP	Other Federal and State Programs	Cumulative Effects of Preferred Alternative and other USDA, Federal, and State Programs
Biological Resources	Protection and enhancement of wildlife habitat are the goals of WHIP and CRP. These programs restore native vegetation resulting in positive impacts to wildlife and protected species. Through their goals of enhancing wetlands and supporting agricultural production and environmental quality as compatible goals, the WRP and EQIP also benefit vegetation, wildlife and protected species by providing habitat and improving water quality.	Wildlife, fisheries, vegetation and protected species are benefited through programs that protect species and habitat; restore habitat; and improve quality and quantity of water.	CREP compliments other conservation programs of the State of Colorado and together they can produce long-term positive benefits on biological resources. CREP protects, enhances, and restores habitat thus benefiting vegetation, wildlife, and protected species. The Proposed Action is expected to contribute to vegetation and wildlife diversity. Fish and aquatic wildlife will benefit from increased water quantity and quality. Positive impacts to threatened and endangered species, species of concern, and their habitats are expected.
Cultural Resources	Cultural Resources could be affected by activities that result in ground disturbance beyond that which was disturbed by agricultural practices, alter a National Register listed or eligible structure, or involve activities affecting TCPs. Cultural Resources identified on lands enrolled in these programs would be protected and preserved through consultation process with the SHPO and Tribal governments.	Like the USDA programs, other Federal and State programs could affect known or unknown Cultural Resources if they resulted in the disturbance of previously undisturbed ground, alteration of a National Register listed or eligible structure, or involve activities affecting TCPs. Cultural Resources identified on such lands would be protected and preserved through consultation process with the SHPO and Tribal governments.	Like other USDA, Federal, and State programs, the proposed CREP Agreements could result in impacts to Cultural Resources if the activities associated with them resulted in the disturbance of previously undisturbed ground, alteration of National Register listed or eligible structure, or affected TCPs. As with the other programs, appropriate consultation with the SHPO and Tribal governments would ensure protection of Cultural Resources and would eliminate potential negative impacts, both incremental and cumulative.

Table 5.2 Cumulative Effects Matrix (cont'd.)

Resource	USDA Programs CRP, WHIP, WRP, EQIP	Other Federal and State Programs	Cumulative Effects of Preferred Alternative and other USDA, Federal, and State Programs
Water Resources	All of these USDA programs could result in long term positive impacts to water quality. WRP is specifically designed to enhance wetlands, CRP goals also target improving water quality. Both programs would be expected to improve surface and ground water quality, increase wetland function and stabilize floodplains. EQIP and WHIP practices that result in reduced runoff, use of agricultural chemicals, and reductions in irrigation could also have positive impacts to surface and ground water quality as well as contributing to the health of wetlands and the stability of floodplains.	Several programs, groups, and agencies' main focus is the improvement of water resources in Colorado.	The proposed CREP Agreements, along with other USDA, Federal, and State Programs, are expected to result in positive long term cumulative impacts to surface water quality, groundwater quality and quantity, wetland acreage and function, and floodplain stabilization.
Soil Resources	All of these USDA programs could result in long term positive impacts to soil resources. Programs that establish permanent vegetation result in stabilizing soils, reducing erosion, and preserving localized topographic features.	Soil resources are benefited through other conservation programs that protect habitat and restore habitat by decreasing land affected by increased levels of soil erosion.	The proposed CREP Agreements would complement other programs and together are expected to result in long term positive cumulative impacts to soil resources on the lands enrolled in the program.

Table 5.2 Cumulative Effects Matrix (cont'd.)

Resource	USDA Programs CRP, WHIP, WRP, EQIP	Other Federal and State Programs	Cumulative Effects of Preferred Alternative and other USDA, Federal, and State Programs
Recreation	Recreational opportunities are indirectly benefited through USDA conservation programs that protect and restore habitat. The associated increases in fish and wildlife populations are expected to positively impact recreational activities such as hunting, fishing, bird and other wildlife watching.	Like with USDA programs, recreational opportunities are indirectly benefited through other Federal and State conservation programs that protect and restore habitat, resulting in improved wildlife-related recreational opportunities.	CREP protects, enhances and restores habitat for fish and wildlife. Additionally, it increases water quantity and quality. This will indirectly benefit recreational opportunities. These aspects of CREP compliment other conservation programs and benefit recreation in the CREP area and surrounding areas.
Socioeconomics	USDA conservation programs generally offer monetary compensation for restoration and retirement of agricultural lands. The loss of agricultural lands may adversely affect economies from a small decrease in agricultural production and its associated economic benefits. Increased recreational opportunities from increases in wildlife and fisheries would benefit economies.	Other conservation programs that offer monetary compensation for restoration and retirement of agricultural or other lands may result in economic impacts similar to those described for USDA programs.	CREP monetarily compensates for restoration and retirement of agricultural lands. The loss of agricultural lands may adversely affect economies from a small decrease in agricultural production and its associated economic benefits. Increased recreational opportunities from increases in wildlife and fisheries would benefit economies. These aspects of CREP are additive to the affects of other conservation programs and are not expected to produce appreciable cumulative impacts.

Table 5.2 Cumulative Effects Matrix (cont'd.)

Resource	USDA Programs CRP, WHIP, WRP, EQIP	Other Federal and State Programs	Cumulative Effects of Preferred Alternative and other USDA, Federal, and State Programs
Environmental Justice	The area affected by this proposal is not considered impoverished or an area of concentrated minority population. Therefore no Environmental Justice issues are anticipated.	The area affected by this proposal is not considered impoverished or an area of concentrated minority population. Therefore no Environmental Justice issues are anticipated.	The area affected by this proposal is not considered impoverished or an area of concentrated minority population. Therefore, the Preferred Alternative will have no individual or cumulative Environmental Justice impacts.

5.4 Irreversible and Irretrievable Commitment of Resources

NEPA requires that environmental analysis include identification of any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources has on future generations. Irreversible effects primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. For the Proposed Action, no irreversible or irretrievable resource commitments are expected.

6.0 MITIGATION MEASURES

6.1 Introduction

The purpose of mitigation is to avoid, minimize, or eliminate negative impacts on affected resources to some degree. CEQ Regulations (40 CFR 1508.20) state that mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

6.2 Roles and Responsibilities

CEQ Regulations state that all relevant reasonable mitigation measures that could improve a project should be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies. This serves to alert agencies or officials who can implement these extra measures, and will encourage them to do so. The lead agency for this Proposed Action is FSA.

6.3 Mitigation Matrix

There are no negative impacts associated with the Proposed Action; therefore, there are no mitigation measures. A mitigation matrix is not needed.

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