Programmatic Environmental Assessment

California North Central Valley
Conservation Reserve Enhancement Program

USDA Farm Service Agency

February 2006

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Cover Sheet

Mandated Action:

The United States Department of Agriculture, Commodity Credit Corporation and the State of California have agreed to implement the North Central Valley Conservation Reserve Enhancement Program, 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.C. 3830 et seq.), and the regulations at 7 CFR 1410. In accordance with the 1985 Act, Commodity Credit Corporation is authorized to enroll lands through December 31, 2007.

The Farm Service Agency of USDA proposes to enter into a CREP agreement with the State of California. CREP is a voluntary land conservation program for State agricultural landowners.

Type of Document: Programmatic Environmental Assessment

Lead Agency: United States Department of Agriculture, Farm Service Agency

Sponsoring Agencies: California Farm Service Agency

Cooperating Agencies: United States Departments of Agriculture,
Natural Resources Conservation Service

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Comments:

This Programmatic Environmental Assessment was prepared in accordance with USDA FSA National Environmental Policy Act (NEPA) implementation procedures found in 7 CFR 799, as well as NEPA, Public Law 91-190, 42 U.S.C. 4321-4347, 1 January 1970, as amended. Once this document is finalized a Notice of Availability will be printed in the Federal Register. Following the Notice of Availability FSA will provide a public comment period prior to any FSA decision.

Any written comments regarding this assessment shall be submitted to:

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Executive Summary

Purpose of and Need for the Programmatic Environmental Assessment

The purpose of this Programmatic Environmental Assessment (PEA) is to provide to the general public an analysis of the environmental, social, and economic effects of implementing the California North Central Valley (NCV) Conservation Reserve Enhancement Program (CREP). This PEA specifically addresses the consequences of implementing two alternatives: a no action alternative and a proposed action alternative.

The Farm Service Agency (FSA) has prepared this PEA in accordance with its National Environmental Policy Act (NEPA) implementation regulations found in 7 CFR 799, as well as NEPA, Public Law 91-190, 42 U.S.C. 4321-4347, 1 January 1970, as amended.

Purpose and Need for the Proposed Action

The purpose of the CREP is to improve water quality and quantity, improve wildlife habitat including threatened and endangered species, and prevent soil erosion. By reducing nutrients, sediments, and chemical runoff from agriculture sources, the area's water quality will improve.

The NCV CREP is specifically designed to improve and increase wildlife habitat in the NCV, particularly for upland bird species. The Central Valley is important habitat to many types of wildlife. It is considered one of the most important areas for bird habitat, particularly for waterfowl, in North America.

Description of Alternatives

The alternatives that will be discussed in the PEA include two possible actions: Alternative A (No Action)—Continue Current Agricultural Practices and Alternative B (Proposed Action)—Implement the NCV CREP. No other alternatives are being developed at this time.

Alternative A (No Action)—Continue Current Agricultural Practices

Existing Federal and State programs would be relied upon to slow the current rates of water quality degradation, soil erosion, and wildlife habitat loss.

The Central Valley of California has experienced the most extensive wildlife habitat loss of any agricultural region in the nation. For example, 95 percent of the Valley's historic wetlands, 98 percent of the riparian habitat, and over 90 percent of the grasslands have been lost, primarily as a result of flood control projects and conversion to cropland (Proposal 2000). Under Alternative A, wildlife habitat loss may continue. Current agricultural practices would continue and modes of agricultural production would remain as they have for decades. With no financial incentive to convert cropland to wildlife habitat, implementing Alternative A would ensure existing cropland would continue to be used for crops.

Alternative B (Proposed Action)— Implement the NCV CREP

Alternative B is the preferred alternative and targets 10,500 acres for the installation and maintenance of selected conservation practices (CPs). Land placed under CREP contracts would be removed from crop production and irrigation for 10 years. CREP would provide the financial and technical assistance to eligible California producers to voluntarily establish CPs that would conserve soil and water, filter nutrients and pesticides, and enhance and restore wildlife habitat.

A summary comparison of the two alternatives can be found in Tables 2.5 and 2.6 on pages 2-9 and 2-10 respectively.

How to Read this Programmatic Environmental Assessment

The PEA is organized into the following three chapters:

- Chapter 1 (Purpose and Need for Action);
- Chapter 2 (Alternatives Including the Proposed Action); and
- Chapter 3 (Affected Environment and Environmental Consequences)

Chapter 1 is an introductory chapter that outlines the purpose and need for preparing a document of this type as well as the purpose and need for CREP. Chapter 1 also briefly introduces the resource issues and discusses the issues eliminated and the reasons they were eliminated from further analysis.

Chapter 2 describes the actions proposed in the PEA including the two alternatives described above. Alternatives are compared in summary tables in terms of their individual environmental impacts and their achievement of objectives.

Chapter 3 provides a general description of the resource area including a summary of ecological regions, climate, history of irrigation practices, profile of agricultural activities (baseline conditions), soil, and land use and ownership. Following the background information is a more detailed analysis of each of the resources most likely to receive impacts from the alternatives including:

- Surface Water
- Groundwater
- Drinking Water
- Wetlands
- Floodplains
- Biological Resources
- Cultural/Tribal Resources
- Environmental Justice
- Human Health, Social, and Economic Issues
- Air Quality
- Cumulative Effects

Each resource is discussed in a separate section which has combined the analyses of the Affected Environment (or Existing Conditions) and Environmental Consequences (Effects of Alternative A and B). Each section, in general, is organized as follows:

- Introduction
- Existing Conditions
- Impacts
- Effects of Alternative A
- Effects of Alternative B

How the Programmatic Environmental Assessment was Prepared

The best available information was used in the development of this document with the majority of information being obtained from State and Federal agency reports. The majority of these reports came from the following agencies:

- Central Valley Regional Water Quality Control Board
- State Water Resources Control Board
- U.S. Census Bureau
- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency
- USDA, National Agricultural Statistics Services
- USDA, Farm Service Agency
- U.S. Geologic Survey

Public Comments

A Notice of Availability was published in the local newspapers concurrent with the PEA. No comments were received concerning the Draft PEA. Any written comments concerning this PEA should be submitted to:

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Acronyms and Abbreviations

ASCS	Agricultural Stabilization and Conservation Service
BA	biological assessment
BMP	Best Management Practice
BO	Biological Opinion
CAA	Clean Air Act
CCC	Commodity Credit Corporation
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CO	carbon monoxide
CP	Conservation Practice
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CVHJV	Central Valley Habitat Joint Venture
CWA	Clean Water Act
CWC	California Water Code
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DHS	California Department of Health Services
DPS	distinct population segment
DWR	California Department of Water Resources
DWSAP	Drinking Water Source Assessment and Protection
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FSA	Farm Service Agency
FWS	U.S. Fish and Wildlife Service
HIV	Human Immunodeficiency Virus
IWCP	Inland Wetlands Conservation Program
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
mgal/day	million gallons per day
MSFW	Migrant and Seasonal Farm Worker
NCV	North Central Valley
NEPA	National Environmental Policy Act
NH_3	ammonia
NHPA	National Historic Preservation Act
NO_x	oxides of nitrogen
NRCS	Natural Resources Conservation Service
NWR	National Wildlife Refuge
NWSRA	National Wild and Scenic Rivers Act
O_3	ozone
PCBs	Polychlorinated Biphenyls
PEA	Programmatic Environmental Assessment
PM_{10}	particulate matter smaller than 10 microns in diameter

$PM_{2.5}$	particulate matter smaller than 2.5 microns in diameter
PWEP	Permanent Wetland Easement Program
RHJV	Riparian Habitat Joint Venture
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SDWA	Safe Drinking Water Act
SO_x	oxides of sulfur
SWRCB	State Water Resources Control Board
T&E	Threatened and Endangered
TCP	Traditional Cultural Property
TMDL	Total Maximum Daily Load
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WBP	Water Bank Program
WMA	Wildlife Management Area
WSR	Wild and Scenic Rivers

Chapter 1.0 Purpose of and Need for Action

1.1 Introduction

1.1.1 Conservation Reserve Enhancement Program Overview

The U.S. Department of Agriculture (USDA)/Commodity Credit Corporation (CCC) and the State of California propose to continue the Conservation Reserve Enhancement Program (CREP) in California's North Central Valley (NCV) (see Figure 1.1). Enrollment began in 2001 and will continue through 2007, with new enrollments made annually. There is currently 4,947.2 acres enrolled in NCV CREP.

CREP is a component of the Farm Service Agency's (FSA's) Conservation Reserve Program (CRP), which targets the specific environmental needs of each State. CRP was established under subtitle D of the Food Security Act of 1985. The purpose of CRP is to cost effectively assist owners and operators in conserving and improving soil, water, and wildlife resources on their farms and ranches. Highly erodible and other environmentally sensitive acreage, normally devoted to the production of agricultural commodities, is converted to a long term resource conservation cover. CRP participants enter into contracts for periods of 10 years in exchange for annual rental payments and cost-share assistance for installing certain conservation practices (CPs). Supplemental State agreements would remain in effect for longer durations (Proposal 2000).

The initial goal of CRP was to reduce soil erosion on highly erodible cropland. Subsequent amendments of the CRP regulations have made certain cropland and pastureland eligible for CRP based on its benefits to water quality and wildlife habitat. The Farm Security and Rural Investment Act of 2002 authorized CRP through 2007 and raised the overall enrollment cap to 39.2 million acres.

In 1997, the Secretary of Agriculture initiated CREP as a joint Federal-State partnership that provides agricultural producers with financial incentives to install FSA-approved CPs. CREP is authorized pursuant to the 1996 Federal Agriculture Improvement and Reform Act. CREP agreements are done as partnerships between USDA, State and/or Tribal governments, other Federal and State agencies, environmental groups, wildlife groups, and other non-government organizations. This voluntary program uses financial incentives to encourage producers to enroll in contracts of 10 to 15 years in duration to remove lands from agricultural production. Through CREP, producers can receive annual rental payments and cost-share assistance to establish long term, resource conserving covers on eligible land. The two primary objectives of CREP are to:

- Coordinate Federal and non-Federal resources to address specific conservation objectives of a State (or Tribal) Government and the nation in a cost-effective manner.
- Improve water quality, erosion control, and wildlife habitat related to agricultural use in specific geographic areas.

This Final Programmatic Environmental Assessment (PEA) has been conducted in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended 42 USC 4321 – 4347, the NEPA implementing regulations of the Department of Agriculture, 7 CFR Part Ib, and the FSA NEPA implementation procedures found in 7 CFR Part 799. This PEA does not address individual site specific impacts.

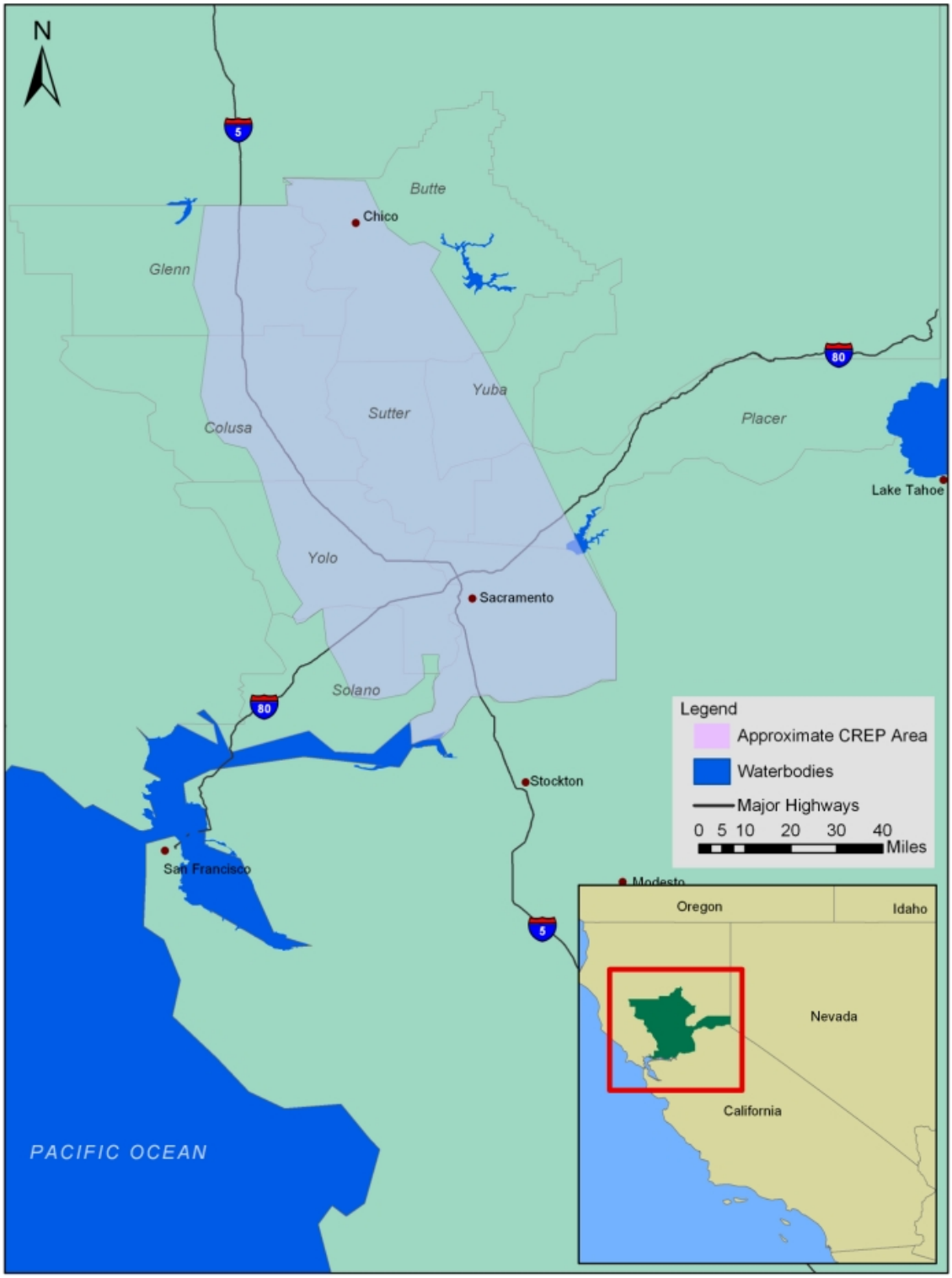

Figure 1.1. NCV CREP counties with the approximate CREP boundaries.

CRP and CREP are administered by FSA in cooperation with the Natural Resources Conservation Service (NRCS), Cooperative State Research and Education Extension Service, State forestry agencies, and local Soil and Water Conservation Districts. FSA is the lead agency developing this PEA. For additional information on this Final PEA, contact Larry Plumb, State Conservationist, Farm Service Agency, 430 G. Street, Davis, CA 95616, (530) 792-5520.

1.1.2 Purpose of Using an Environmental Assessment to Analyze this Action

FSA's regulations for NEPA are found at 7 CFR part 799. Both of these environmental regulations classify the Agency's actions into levels of environmental review such as Categorical Exclusions, Environmental Assessments, and Environmental Impact Statements (EISs). The National Historic Preservation Act (NHPA) compliance and other cultural resource considerations also are incorporated into FSA's NEPA process.

FSA prepared this PEA to address the implementation of the CREP to comply with NEPA, Council on Environmental Quality (CEQ) Regulations, and 7 CFR 799: Environmental Quality and Related Environmental Concerns—Compliance with the NEPA.

FSA has a framework in place to ensure NEPA compliance at the field level, where site specific NEPA evaluations will take place prior to implementing a CREP contract. An environmental evaluation worksheet will be completed for each CREP contract when the conservation plan is developed. If necessary a site specific EA may be required.

A PEA allows FSA to reduce paperwork and identify potential impacts at a State level to be aware of at a site specific level. Regulations promulgated by the CEQ state the following:

Sec. 1500.4 Reducing paperwork:

> (i) Using program, policy, or plan EISs and tiering from statements of broad scope to those of narrower scope, to eliminate repetitive discussions of the same issues (Secs. 1502.4 and 1502.20).

Sec. 1502.4 Major Federal actions requiring the preparation of EISs:

> (b) EISs may be prepared, and are sometimes required, for broad Federal actions such as the adoption of new agency programs or regulations (Sec. 1508.18). Agencies shall prepare Statements on broad actions so that they are relevant to policy and are timed to coincide with meaningful points in agency planning and decision-making.
>
> (c) When preparing Statements on broad actions (including proposals by more than one agency), agencies may find it useful to evaluate the proposal(s) in one of the following ways:
>
> > 1. Geographically, including actions occurring in the same general location, such as body of water, region, or metropolitan area.
> >
> > 2. Generically, including actions which have relevant similarities, such as common timing, impacts, alternatives, methods of implementation, media, or subject matter.
> >
> > 3. By stage of technological development including Federal or federally assisted research, development or demonstration programs for new technologies which, if applied, could significantly affect the quality of the human environment. Statements shall be prepared on such programs and shall be available before the program has reached a stage of investment or commitment to implementation likely to determine subsequent development or restrict later alternatives.

1.2 Purpose of the Proposed Action

The purpose of the NCV CREP is to enhance the water quality of NCV by reducing the amount of nutrients, sediments, and chemical runoff from agriculture sources while increasing wetland and upland habit for resident and migrating birds and other wildlife. Implementation of approved FSA CPs is designed to improve the water quality of discharges coming from agricultural land (Proposal 2000).

The primary goal of the NCV CREP is to provide an opportunity, through financial and technical assistance within these targeted watersheds, for eligible producers in California to voluntarily establish buffers, grass waterways, wildlife habitat, and other approved CPs that improve the water quality of agricultural nonpoint discharges. In addition, implementing CREP would:

- Improve drinking water supplies for local communities;
- Protect and conserve the diversity of aquatic life including threatened and endangered (T&E) species;
- Protect and conserve the diversity of terrestrial wildlife including T&E species;
- Improve water-based recreation;
- Improve wildlife habitat for increased hunting potential;
- Improve private and commercial fishing and shell fishing harvests;
- Decrease the cost of drinking water treatment;
- Decrease the cost of aquatic vegetation control;
- Improve soil quality; and
- Provide economic benefits to the producer.

1.3 Need for the Proposed Action

The Central Valley, including the area of the NCV CREP, covering portions of Butte, Colusa, Glenn, Placer, Sacramento, Solano, Sutter, Yolo, Yuba Counties, is important habitat to many types of wildlife. The project area has been identified as a priority for wildlife conservation under many State initiatives and policies. It is considered one of the most important areas for bird habitat, particularly for waterfowl, in North America. In addition, many T&E species exist in the project area (Proposal 2000).

However, the Central Valley has experienced extensive wildlife habitat loss, including virtually all of the native grasslands, approximately 95 percent of the wetlands, and 98 percent of the riparian forests. Most of these native habitats have been converted to cropland or lost because of flood control projects, urbanization, or introduced exotic species (Proposal 2000).

The Central Valley, as a whole, is one of the most important agricultural regions in the world, producing over 250 different crops and $16 billion of farm products annually. The areas extensive loss of wildlife habitat and the corresponding decline of many species, if not reversed, will ultimately threaten the region's agricultural viability as the listing of T&E species often requires adjusting farm practices, burdening land owners with additional restrictions that can make farming less profitable. The NCV CREP is voluntary conservation program that represents an effective way to improve ecological balance of cropland and wildlife habitat. By maintaining irrigated cropland on good soils where farming is more profitably and re-establishing wetlands, upland cover, and riparian buffers in marginal agricultural areas, the agricultural economy could be maintained while preventing the future listing of declining species (Proposal 2000).

Many unique natural areas are located within the proposed project area. Some of these are listed in Table 1.1.

Table 1.1. Unique natural areas located in the CREP project area.

Nature Conservancy Preserves	
Sacramento River	Consumnes River
National Wildlife Refuges	
Butte Sink	Sacramento
Colusa	Sacramento River
Delevan	Sutter
State Parks	
Bidwell-Sacramento River	Burton Creek
State Wildlife Areas	
Antelope Valley	Miner Slough
Collins Eddy	Orolville
Colusa Bypass	Putah Creek
Coon Hollow	Smithneck Creek
Crocker Meadows	Spenceville
Daugherty Hill	Sutter Bypass
Decker Island	Truckee River
Hallelujah Junction	Upper Butte Basin
Heenan Lake	Warner Valley
Hope Valley	White Slough
Lower Sherman Island	
State Ecological Reserves	
Butte Creek Canyon	North Table Mountain
Butte Creek House	Woodbridge
Calhoun Cut	
National Natural Landmarks	
American River Bluffs and Phoenix Park Vernal Pools	Cosumnes River Riparian Woodlands
Dixon Vernal Pools	
National Forests	
Plumas	Mendocino
Lassen	

1.4 Objectives of the NCV CREP

The primary goal of the NCV CREP is to provide financial and technical assistance to eligible producers within targeted areas of California. This assistance will help to establish filter strips, buffers, native and introduced grasses, wildlife habitat, wetland areas, and/or other approved CPs that improve wildlife habitat and water quality of the area.

The primary objectives of this agreement are to achieve, to the extent practicable, the following:

1.4.1 Objective #1: Improve wildlife habitat for breeding waterfowl

Indicators:

- Increase average nest densities to 0.45 nests per acre and increase nest success by 25 percent on CREP properties resulting in hatching 10,125 additional ducklings each spring.

- Nest densities to an average of one nest per acre and increase nest success by 30 percent in areas adjacent to pair and brood water resulting in hatching 20,000 additional ducklings each spring.
- Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats.
- Implementation of CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.

1.4.2 Objective #2: Improve wildlife habitat for ring-necked pheasants

Indicators:

- Two pheasants per acre on CREP enrolled uplands resulting in 20,000 additional pheasants annually.
- Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats.
- Implementation of CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.

1.4.3 Objective #3: Improve wildlife habitat for grassland birds

Indicators:

- Establish detectable numbers of individuals of certain targeted species.
- Develop specific population goals for future management efforts.
- Collect first-time quantitative and comparative baseline data on breeding bird densities on upland set-aside habitats.
- Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats.
- Implementation of CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.

1.4.4 Objective #4: Improve water quality and conserve soil

Indicators:

- Establishment of upland cover in cropland areas subject to erosion.
- Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats.
- Implementation of CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.

1.5 Area Covered by NCV CREP

The proposed area includes portions of nine counties. The counties with portions in the NCV CREP project area are (Proposal 2000):

- Butte
- Colusa
- Glenn
- Placer
- Sacramento
- Solano
- Sutter
- Yolo
- Yuba

1.6 Relevant Laws, Regulations, and Other Documents

CREP would need to be compliant with a wide range of laws, regulation, and Executive Orders and this section includes a list of Federal and State laws and regulations, and Executive Orders that may be applicable to CREP. A more detailed description of Federal laws and regulations is included in Appendix A.

It is anticipated that implementation of CREP would complement existing conservation programs and a description of existing Federal and State conservation programs is also included.

1.6.1 Federal Laws, Regulations, and Other Documents

Relevant Federal laws and regulations that may be applicable to implementation of CREP include the following:

- Clean Water Act (CWA) of 1972
- Endangered Species Act (ESA) of 1973
- Federal Insecticide, Fungicide, and Rodenticide Act of 1947
- Food Security Act of 1985
- NEPA
- NHPA
- Safe Drinking Water Act (SDWA) of 1974
- Sustainable Fisheries Act of 1996
- Executive Order (EO) 11988: Floodplain Management
- EO 11990: Protection of Wetlands
- Comprehensive State Groundwater Protection Program

1.6.2 California State Laws Affecting Agriculture

Individual CREP projects would need to ensure compliance with the following State laws, where necessary (NASDA 2005):

- California Environmental Quality Act
- CAL. WATER CODE §13376 -- Compliance with provisions of the Federal Water Pollution Control Act as amended in 1972 (33 U.S.C. §1251 *et seq.*)
- CAL. WATER CODE §13350 -- Enforcement and Implementation—Civil Monetary Remedies
- 12 CAL. CODE REGS. TITLE 14 (Natural Resources), §17823.1 -- Minimum Standards for Solid Waste Handling and Disposal—Agricultural Solid Waste Management Standards—Animal Manure
- 13 CAL. CODE REGS. TITLE 27 (Environmental Protection), §22560 *et seq.*--State Water Resources Control Board—Confined Animal Facilities
- CAL. WATER CODE §13754-- Water Wells and Cathodic Protection Wells—Reports
- CAL. CODE REGS. TITLE 17 (Public Health), §80150--Smoke Management Guidelines for Agricultural and Prescribed Burning—District Smoke Management Program—Special Requirements for Open Burning in Agricultural Operations in the Growing of Crops or Raising of Fowl or Animals.
- CAL. CODE REGS. TITLE 14 (Natural Resources), §17407.4-- Minimum Standards for Solid Waste Handling and Disposal—Operating Standards—Dust Control

- CAL. CODE REGS. TITLE 14 (Natural Resources), §17801--Minimum Standards for Solid Waste Handling and Disposal—Agricultural Solid Waste Management Standards—Intent of Standards
- CAL. HEALTH AND SAFETY CODE §25250.5--Management of Used Oil
- Toxic Pits Cleanup Act of 1984 [CAL. HEALTH AND SAFETY CODE §25208]
- CAL. CODE REGS. TITLE 3 (Food and Agriculture), §§6500-6636--Pest Control Operations—Licensing/Work Requirements—General License Requirements/Pest Control Operations Generally
- CAL. FOOD AND AGRICULTURAL CODE §11705 *et seq.*--Pest Control—Licenses and Permits
- CAL. FISH AND GAME CODE §2099 *et seq.*--Endangered Species—Funding
- CAL. FISH AND GAME CODE §§5650, 5650.1, 5651--Pollution—General
- CAL. CODE REGS. TITLE 14 (Natural Resources), §630--Ecological Reserves
- CAL. FISH AND GAME CODE §1584--Fish and Game Management—Ecological Reserves
- CAL. CODE REGS. TITLE 3 (Food and Agriculture), §3250 *et seq.*--Plant Quarantine—Exterior Quarantine (Regulations)—Citrus Pests Exterior Quarantine
- CAL. FOOD AND AGRICULTURAL CODE §9141 *et seq.*--Diseased Animals and Poultry—Disposal of Carcasses
- CAL. CODE REGS. TITLE 14 (Natural Resources), §17823.5--Minimum Standards for Solid Waste Handling and Disposal—Agricultural Solid Waste Management Standards—Dead Animals
- CAL. CODE REGS. TITLE 22 (Social Security), §60301 *et seq.*--Environmental Health—Water Recycling Criteria
- CAL. CODE REGS. TITLE 14 (Natural Resources), §17850 *et seq.*--Compostable Materials Handling Operations and Facilities Regulatory Requirements—General—Authority and Scope
- CAL. GOV. CODE §65570(b) *et seq.*--Local Planning—Open-Space Lands
- CAL. GOV. CODE §51230 *et seq.*--Agricultural Land—Agricultural Preserves
- CAL. REV. AND TAX CODE §420 *et seq.*--Legal Description of Lands for Assessments Purposes—Assessment Generally—Valuation of Open-Space Land Subject to an Enforceable Restriction

1.7 Decisions that Must be Made

FSA must determine if the selected alternative would or would not constitute a major Federal action significantly affecting the quality of the human environment. If FSA was determined that it would not significantly affect the quality of the human environment, and a Finding of No Significant has been prepared and signed. Pending CREP applications will now go through the site specific environmental review.

1.8 Scoping and Resource Issues

1.8.1 Scoping

CREP was initiated in 1997 and is a joint Federal and State land conservation program. CREP uses authorities of the CRP in combination with California State resources to target specific conservation and environmental objectives of California and the nation.

In addition to individual farmers and local businesses, the following organizations have reviewed and support the NCV CREP (Proposal 2000):

- Central Valley Habitat Joint Venture (CVHJV)
- California Waterfowl Association
- Ducks Unlimited
- Pheasants Forever
- The Nature Conservancy
- National Audubon Society
- California Department of Fish and Game (CDFG)
- California Department of Water Resources (DWR)
- U.S. Fish and Wildlife Service (FWS)
- NRCS State Technical Committee
- Point Reyes Bird Observatory

For the original CREP Agreement FSA initiated formal consultation pursuant to Section 7 of the ESA. As a result of this consultation the FWS issued a Biological Opinion (BO) on January 2, 2002, concerning the NCV CREP (FWS 2002). The BO identified the Valley elderberry longhorn beetle and giant garter snake as threatened species that could potentially be affected by CREP implementation.

The BO issued in 2002 mentioned, but did not fully address, the California tiger salamander (which was a candidate species at that time). The California tiger salamander has since been elevated to threatened status across its entire range and critical habitat has been proposed in its historic range, including habitat in several CREP counties. FSA initiated formal consultation with FWS as a result, since reinitiation of consultation on an existing BO due to a new species listing or critical habitat designation is treated as a new consultation. FWS requested that FSA provide FWS with the necessary project information to allow them to amend the existing BO to address the California tiger salamander and its habitat. FWS also asked that FSA informally consult with FWS on a case-by-case basis for each CREP contracts, until such time as an amended California CREP BO is finalized and formal consultation is completed. For each CREP contract, FSA will provide FWS with a description of the project, a site assessment that complies with FWS's site assessment guidance for the species, and a statement of the effect of the proposed project on the species and its habitat.

1.8.2 Relevant Resource Issues

The following resources studied would be affected by the NCV CREP: surface water; groundwater; drinking water; wetlands; floodplains; critical habitat or T&E species; cultural/tribal resources; Environmental Justice, human health; social, and economic issues; and air quality. Chapter 3 discusses each of the issues in more detail. Affected resources issues are introduced below.

Issue #1: Surface water resources susceptibility to agricultural practices

The NCV CREP project area is located in the lower Sacramento River watershed. The Sacramento River is the largest river in California, with an average annual runoff of 22 million acre-feet. This is approximately one third of the total runoff in the State. The river is vital to the State's economy and is a major source of drinking water for residents of northern and southern California. In addition, the Sacramento River is a principal source of irrigation water for Sacramento and San Joaquin Valley farmers and freshwater flow to the San Francisco Bay (USGS 2005a). Over 90 percent of streams and rivers in the CREP project area are listed on the 2002 303(d) list for a number of pesticides including organophosphate pesticides (CVRWQCB 2005a). Surface water resources are discussed in Section 3.5.

Issue #2: Groundwater susceptibility to agricultural practices

Groundwater provides about 31 percent of the water supply for urban and agricultural uses in the Sacramento River watershed. The Sacramento Valley is recognized as one of the foremost groundwater basins in the State and wells developed in the sediments of the valley provide excellent supply to irrigation, municipal, and domestic uses. Many of the mountain valleys of the region also provide

significant groundwater supplies to multiple uses (DWR 2005b). Groundwater provides all or a portion of municipal supply in many valley towns and cities throughout the watershed. Domestic use of groundwater varies, but in general, rural unincorporated areas rely completely on groundwater (CVRWQCB 2005a). The dominant use of groundwater in CREP counties is irrigation (86 percent), followed by public supply for drinking water (11 percent) (USGS 2005b). Section 3.6 discusses current issues affecting groundwater resources.

Issue #3: Drinking water susceptibility to agricultural practices

The Sacramento/San Joaquin River Delta is the source of drinking water for two thirds of California's population (over 20 million people). In addition, the Sacramento and San Joaquin rivers and many of their tributaries are sources of drinking water to many residents of the Central Valley and foothills (CVRWQCB 2005c). Nitrate contamination is pervasive throughout the State and is found in both surface and groundwater supplies and is the single biggest threat to California's drinking water (LLNL 2002). Section 3.7 discusses issues relating to drinking water.

Issue #4: Wetlands susceptibility to agricultural practices

Wetlands remove excess nutrients and filters sediments from the water that flows through them. Wetlands also provide habitat for many migratory and resident bird species. The entire Central Valley has lost approximately 95 percent, leaving only 300,000 of the original four million acres. Most of these losses resulted from agricultural conversion and flood control projects (Proposal 2000). Current issues affecting wetlands are discussed in Section 3.8.

Issue #5: Floodplain susceptibility to agricultural practices

Floodplains are of concern to agricultural practices throughout the State. The prevention of flooding in sensitive areas or utilizing floodwater retention to mitigate nutrient and sediment inflows to watersheds should be addressed. Construction activities (e.g., constructed wetlands) have the potential to modify flowage and storage capacity and should be analyzed. Issues affecting floodplains are discussed in Section 3.9.

Issue #6: Biological resources susceptibility to agricultural practices

Habitat degradation from human population growth, habitat fragmentation, invasive exotic species, and pollution threaten biological resources. Two areas in the CREP project area have been designated as critical habitat for the protected valley elderberry longhorn beetle. Current trends and issues affecting biological resources, including protected species, are discussed in Section 3.10.

Issue #7: Cultural / tribal resource susceptibility to agricultural practices

California's long history of American Indian culture and European settlement has endowed the State with a diverse collection of historic and cultural resources worthy of preservation. To analyze potential impacts at a statewide level is unrealistic for purposes of this PEA. However, site specific cultural reviews will ensure protection of these vital resources. A discussion of State cultural resources is found in Section 3.11.

Issue #8: Environmental Justice impacts from agricultural practices

All Federal programs, including CREP, must comply with EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. Although unlikely, agriculture and CREP has the potential to affect minority and other marginalized populations. Environmental Justice issues are discussed in Section 3.12.

Issue #9: Human health, social, and economic impacts from agricultural practices

The NCV CREP proposes the potential enrollment of up to 10,500 acres across northern Sacramento Valley. Agriculture is one of the top industries in the State, and CREP implementation may affect multiple aspects of the economic climate, including farm laborers, farm owners, and the service industry. Human health and other sociological concerns may also be impacted by CREP implementation. CREP has the potential to affect low income migrant farm workers' health and financial well being. A discussion of the issues affecting human health, social, and economic issues is found in Section 3.13.

Issues #9: Air quality impacts from agricultural practices

Over 500,000 acres of rice are grown each year in the Sacramento Valley. The post-harvest burning of rice stubble represents the chief agriculture-related air quality concern within the project area. Post-harvest burning results in emissions of smoke and other pollutants that contain inhalable particulate matter (Proposal 2000). Current issues affecting air quality concerns are discussed in Section 3.14.

1.8.3 Resources / Issues Eliminated from Detailed Study

The NCV CREP would not affect the following resources:

Noise

There would be no perceptible impacts from noise as a result of CREP implementation. Following the short-term construction noise, as the conservations practices are installed, there would be no continual impacts on the local soundscape. With the permanent easements and long-term nature of the CPs, which will result in decreased agricultural activities on CREP lands, noise level can be expected to decrease slightly. As a result, FSA eliminated noise from further analysis as part of this PEA.

Wilderness

Snow Mountain Wilderness straddles the boundaries of Glenn, Colusa, and Lake Counties. The wilderness area is in the high mountain peaks of the Mendocino National Forest and is not within the designated project area. Therefore, wilderness was eliminated from further analysis in this PEA.

Sole Source Aquifers

There are no sole source aquifers located within the project area. Therefore, sole source aquifers were eliminated from detailed study in this PEA.

Wild and Scenic Rivers

The National Wild and Scenic Rivers Act (NWSRA) (16 U.S.C. 1271-1287) was enacted to establish a National Wild and Scenic Rivers System. Wild and Scenic Rivers (WSRs) are selected based upon outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or similar values. The NWSRA mandates designated rivers to be preserved in free-flowing condition and their adjacent borders to be protected for future generations. Rivers are designated as wild, scenic, or recreational according to the classifications outlined by NWSRA. Federal agencies involved in the use and development of water and related land resources are required to protect national wild, scenic, and recreational river areas.

The California Wild & Scenic Rivers Act (Public Resources Code Sec. 5093.50 et seq.) is patterned after the NWSRA and was passed in 1972 to preserve designated rivers possessing extraordinary scenic, recreation, fishery, or wildlife values. The Act provides a number of legal protections for rivers included within the WSR system, beginning with the following legislative declaration (Sec. 5093.50) (FOR 2005):

> It is the policy of the State of California that certain rivers which possess extraordinary scenic, recreational, fishery, or wildlife values shall be preserved in their free-flowing

> state, together with their immediate environments, for the benefit and enjoyment of the people of the State. The Legislature declares that such use of these rivers is the highest and most beneficial use and is a reasonable and beneficial use of water within the meaning of Section 2 of Article X of the California Constitution.

The American River, which is listed on both the National list and on the California list, is the only WSR located within the CREP project boundaries. The designated reach extends from the confluence with the Sacramento River to the Nimbus Dam (NPS 2005 and CALTRANS 2005). Because this reach of the American River is located in the City of Sacramento and is surrounded by urban land use, CREP would have little to no effect on the free-flowing state of the river and will not positively or negatively affect its designation. The designated reach may indirectly benefit from CREP, since CPs implemented on agricultural land upstream would improve water quality and wildlife habitat. For this reason, WSRs are eliminated from further analysis in this PEA.

Chapter 2.0 Alternatives Including the Proposed Action

2.1 Introduction

This chapter describes the actions proposed in the PEA, beginning with the No Action Alternative—Continue Current Agricultural Practices, and ending with the Action Alternative—Implement NCV CREP. Alternatives will be compared in terms of their individual environmental impacts and their achievement of objectives.

2.2 Description of Alternatives

2.2.1 Alternative A (No Action)—Continue Current Agricultural Practices

Agriculture dominates land use in the region of the NCV CREP. Approximately 54 percent of the land in the nine counties of the NCV CREP, or 3,326,777 acres, is occupied by agriculture (NASS 2002 and USCB 2005a). Rice is the primary agricultural product of the area (Proposal 2000). In 2003, agricultural production value for the nine counties was over $2 billion (CASS 2004).

The Central Valley of California has experienced the most extensive wildlife habitat loss of any agricultural region in the nation. For example, 95 percent of the Valley's historic wetlands, 98 percent of the riparian habitat, and over 90 percent of the grasslands have been lost, primarily as a result of flood control projects and conversion to cropland (Proposal 2000). With no financial incentive to convert cropland to wildlife habitat, implementing Alternative A would ensure existing cropland would continue to be used for crops, with no new wetlands, grasslands, or riparian habitat reclaimed. In addition, current agricultural practices use pesticides and fertilizers, negatively impacting wetlands, groundwater, and surface water. Pesticides and fertilizers also contribute to declines in native wildlife populations (FSA 2003). A summary of agricultural chemical use in counties located in the CREP project area can be found in Table 2.1.


Restored WRP Wetland.

With the selection of the No Action Alternative, modes of agricultural production would remain as they have for decades. There would be no incentives to implement FSA approved CPs. The installation of filter strips, buffers, and other CPs that provide natural methods of water purification would not be funded. High levels of pesticides and nutrients would continue to accumulate and pollute watershed systems, furthering the degree of negative ecological impacts. The potential for negative economic impacts resulting from reduced water quality would remain and possibly increase.

Table 2.1. Farmland acres treated with chemicals and manure in counties of NCV CREP area.

	Commercial Fertilizers, Lime, and Soil Conditioners	Manure	Chemicals to Control Insects	Chemicals to Control Weeds, Grass, or Brush	Percent of Farmland using Pesticides	Percent of Farmland using Herbicides	Total Land in Farms (Acres)
California State	7,858,818	725,529	5,522,671	5,343,823	20%	19%	27,589,027
Butte	218,245	3,788	141,009	150,424	37%	39%	381,532
Colusa	300,991	1,334	106,964	188,531	22%	39%	485,392
Glenn	204,427	4,992	102,502	132,924	20%	26%	506,272
Placer	23,077	1,900	5,344	14,971	4%	11%	131,311
Sacramento	136,067	5,251	53,188	105,835	17%	34%	314,317
Solano	145,778	776	70,535	95,690	20%	27%	351,453
Sutter	252,780	1,117	160,857	165,434	43%	44%	371,964
Yolo	302,280	2,894	141,191	210,122	26%	38%	550,407
Yuba	81,996	768	48,880	71,628	21%	31%	234,129
Total Acres in CREP Counties	1,665,641	22,820	830,470	1,135,559			3,326,777
Percent of Total State Acres	21%	3%	15%	21%			
Percent of Total County Acres	50%	0.37%	25%	19%			

Source: NASS 2002 and USCB 2005a.

2.2.2 Alternative B—Implement the NCV CREP

Alternative B targets up to 10,500 acres of land within the NCV watershed; 10,000 acres of which will be dedicated to upland wildlife habitat restoration. CREP provides financial and technical assistance for eligible California producers to voluntarily establish CPs to increase and improve wildlife habitat, while improving water quality. The project would be jointly funded by USDA/CCC and the State of California. As a part of this contribution, California would provide a real property tax incentive for eligible lands meeting requirements enrolled in Federal conservation programs.

Implementing the NCV CREP would decrease the amount of nonpoint source pollution throughout the watershed. The decrease in watershed contaminants would improve water quality, enhance wildlife

habitat, and provide cleaner water sources for drinking, recreation, and other uses to the growing California population.

Conservation Practices

Eight approved CPs have been selected as the best options for achieving the objectives of the NCV CREP:

- CP1 (Permanent Introduced Grasses and Legumes)
- CP2 (Establishment of Permanent Native Grasses)
- CP4D (Permanent Wildlife Habitat)
- CP9 (Shallow Water Areas for Wildlife)
- CP10 (Vegetative Cover, Grass, Already Established)
- CP12 (Wildlife Food Plots)
- CP21 (Filter Strips)
- CP22 (Riparian Buffer)

CPs must meet the minimum specifications outlined in the NRCS Field Office Technical Guide as well as all other applicable Federal, State, and local requirements. Detailed rental and incentive payments, cost-share and maintenance payments, technical requirements, and operating procedures for each practice are outlined in the FSA Handbook 2-CRP and are included in Appendix B of this PEA. Descriptions of each of the selected CPs are in Table 2.2. Because the program designed to be flexible enough to consider the needs of applicants and appropriate environmental factors, it is unknown whether all the CPs will be implemented.

Enrollment in the NCV CREP began in 2001 with 1,706 acres. By the end of 2004, 4,947 acres were enrolled, with almost 44 percent enrolled in Solano County. CP1 (non-native plants) made up 80 percent of the total land enrolled in all the counties (Plumb 2005b). Table 2.3 details the acreage enrolled in each CP by county.

CP Amendments

CREP's flexibility offers the ability to amend CPs to better fit the needs of the landowners and the conditions of the land. The following two CP amendments are needed for effective programs delivery of the NCV CREP.

Proposed CP22 (Riparian Buffer) Amendment: A 300-foot buffer width on riparian buffers to benefit anadromous fish, including the federally proposed endangered spring run Chinook salmon (Proposal 2000).

Proposed CP4D (Permanent Wildlife Habitat) Amendments: Modification of CP4D is necessary for effective program delivery. These include:

- *Eliminating the restriction of eligible land offerings to 10 percent of the producer's total cropland.* Data on grassland nesting birds indicate that upland cover establishments should range in size from 20-80 acres. Small strips of upland cover (5-20 acres) typically concentrate predators, resulting in low nest success. If CP4D was implemented without this amendment, the maximum enrollment would be 30 acres, much less on small farms.
- *Eliminating the woody vegetation requirement of 30 percent of the total CP area.* The establishment of woody vegetation (e.g., shelterbelts, hedgerows, and brush plantings) is not important in the Central Valley because these habitats did not exist historically and are not biologically justified as part of upland cover establishment. In addition, because of the mild winters, woody vegetation is not required for the winter survival of upland wildlife species.
- *Changing the duration of filing easement from 15 years to 10 years.* The 15-year stipulation is not acceptable to land owners in the project area (Proposal 2000).

Table 2.2. Descriptions of the selected CPs of the NCV CREP.

Conservation Practice	Description
CP1 (Permanent Introduced Grasses and Legumes)	The purpose of an introduced grass planting is to establish a vegetative cover of introduced grasses and legumes that will enhance the landscape. Introduced grass plantings provide excellent nesting and brood-rearing cover, and forage for wildlife. The mid-height, stiff, upright grasses grow well along with legumes such as clover and alfalfa to provide good areas for insect production and pollinating insect foraging areas. They provide excellent early and late season forage for grazers such as rabbits, deer and geese. However, they do not stand up to snow and ice and consequently provide fair to poor wintering habitat.
CP2 (Permanent Native Grasses)	This practice establishes a permanent vegetative cover of native grasses on eligible cropland that would enhance environmental benefits. It is used to reduce soil erosion and sedimentation, improve water quality and create or enhance wildlife habitat.
CP4D (Permanent Wildlife Habitat—Non-easement)	This practice creates permanent habitat cover enhancing environmental benefits for the wildlife of the designated or surrounding areas. Habitat components may include seeding, including shrubs and trees, establishing permanent water sources for wildlife, providing temporary cover, and mineral additions. This CP also requires the control of noxious weeds and other undesirable plants, insects, and pests.
CP9 (Shallow Water Areas for Wildlife)	The purpose of this practice is to develop or restore shallow water areas to an average depth of 6 to 18 inches for wildlife. The shallow water area must provide a source of water for wildlife for the majority of the year. This practice must include an adequate buffer area of perennial vegetation to protect the water quality and provide wildlife habitat.
CP10 Vegetative Cover, Grass, Already Established	This practice code is used to identify land where grass cover is appropriate and approved at the time of enrollment.
CP12 (Wildlife Food Plots)	The purpose of this practice is to establish annual or perennial wildlife food plots that would enhance wildlife and wildlife habitat. This practice also provides a buffer between potential contamination sources and water bodies. Permanent grasses and legumes filter runoff water by trapping sediment, nutrients, pesticides and other pollutants.
CP21 (Filter Strips)	Filter strips are narrow bands of grass or other permanent vegetation used to reduce sediment, nutrients, pesticides, and other contaminants. Filter strips are located on cropland or degraded pastures immediately adjacent and parallel to streams, lakes, ponds, ditches, sinkholes, wetlands, or groundwater recharge areas.
CP22 (Riparian Buffer)	Riparian buffers are strips of grass, trees, or shrubs established adjacent to streams, ditches, wetlands, or other water bodies. Riparian buffers reduce pollution and protect surface and subsurface water quality while enhancing the aquatic ecosystem.

Table 2.3. Acres enrolled in each county in the NCV CREP at the end of 2004.

Conservation Practice	County									
	Butte	Colusa	Glenn	Placer	Sacramento	Solano	Sutter	Yolo	Yuba	Totals
CP1 Non-Native Uplands	0	599.2	36.9	0	0	1900.7	222.3	1201.1	0	**3960.2**
CP2 Native Uplands	0	266	7	0	87.8	248.2	60	192	0	**861**
CP9 Shallow Water Areas	0	32	3	0	10	25	10	46	0	**126**
Totals	0	897.2	46.9	0	97.8	2173.9	292.3	1439.1	0	**4947.2**

Source: Plumb 2005b.

Cost Sharing, Payments, and Project Duration

FSA, through the CCC, will make annual rental payments for 10 years on each contract, including annual incentives, and provide up to 50 percent cost-sharing. Table 2.4 details the approved practices and cost-share rates that are authorized to be implemented in the NCV CREP.

CREP rental rates for land enrolled in the NCV CREP would be based on $160 per acre for irrigated rice land and $100 per acre for all other irrigated land. Unlike other CREPs, no signup incentive payments or practice incentive payments will be authorized for the NCV CREP (Amendment 2005).

Table 2.4. Approved practices and cost-share rates authorized for the NCV CREP.

Practice	Rate	CP Length	Maintenance Rate
CP1 - Establishment of Permanent Grasses and Legumes	Up to 50 percent. Not to exceed $75/acre.	10 years	$5/acre
CP2 - Establishment of Permanent Native Grasses	Up to 50 percent. Not to exceed $300/acre.	10 years	$5/acre
CP4D - Permanent wildlife habitat, Noneasement	Up to 50 percent. Not to exceed $250/acre.	10 years	$5/acre
CP9 - Shallow Water Areas for Wildlife[1]	Up to 50 percent. Not to exceed $650/acre.	10 years	$5/acre
CP10 - Already Established Cover	No cost share assistance provided	10 years	$5/acre
CP12 - Wildlife Food Plot	No cost share assistance provided	10 years	Not Applicable
CP21 - Filter Strips	Up to 50 percent. Not to exceed $150.	10-15 years	$5 (no fencing) $7 (with permanent fencing) $10 (fencing and watering facility)
CP22 – Riparian Buffer	Up to 50 percent. Not to exceed $1000.	10-15 years	$5 (no fencing) $7 (with permanent fencing) $10 (fencing and watering facility)

[1] Limit of 10 acre tracts.
Source: Amendment 2005.

Eligibility and Enrollment in CREP

There are two CREP eligibility requirements for landowners:

- A landowner is eligible to offer land for enrollment under the NCV CREP if the land was owned for 12 months before submitting the offer.
- All other producer eligibility requirements in accordance with 2-CRP procedures (Amendment 2005).

There are three eligibility requirements for operators:

- An operator is eligible to offer land for enrollment under the NCV CREP if the land was operated for 12 months before submitting the offer.
- An operator must provide satisfactory evidence that control of the land will continue uninterrupted for the CRP-1 period.
- All other producer eligibility requirements in accordance with 2-CRP procedures (Amendment 2005).

To be eligible for enrollment in the NCV CREP, land must meet the following provisions:

- Be within the CREP project boundaries.
- Be suitable to be devoted to one of the approved CPs.
- Marginal pastureland must be adjacent and parallel to eligible waterbodies within the project boundaries and may only be enrolled if devoted to riparian buffer and planted with trees.
- Eligible cropland must have the following two characteristics:
    - Irrigated land that has been planted or considered planted to an agricultural commodity during any four of the six crop years 1996 through 2001. (Note: Irrigated land is land in which producers have used irrigation facilities and systems to apply water to grow annual commodities).
    - Physically and legally capable of being planted in a normal manner to an agricultural commodity (Amendment 2005).

CREP enrollment within the approved project area will be offered on a continuous basis until the acreage limitations are reached.

Land will be enrolled in CREP according to a State ranking process based on the quality of the land, location, and other factors. Additional ranking points will be given to CREP upland offers if they are adjacent to wetland acres enrolled in the State's Permanent Wetland Easement Program (PWEP) (Plumb 2005a).

Public Outreach and Support

Thus far, information about the NCV CREP has been disseminated by FSA and opinions have been gathered. Agricultural producers strongly support CREP and individual letters can be provided upon request. Various wildlife organizations and agencies also support CREP (Proposal 2000).

The CREP partners plan to develop and implement a detailed public outreach program over the lifespan of the project. The effort will likely include (Amendment 2005):

- Extensive one-on-one technical assistance to growers,
- "Farming for Wildlife" workshops,
- Publication of habitat management guides and other educational materials such as calendars, and
- Participation in forums involving agriculture and wildlife.

Federal Agency Commitments

California FSA will continue its responsibilities for the administration of CRP and CREP by (Amendment 2005):

- Determining producer eligibility,
- Administering all approved CREP contracts,
- Paying up to 50 percent of the eligible reimbursable costs of establishing CRP CPs. Reimbursements to the CREP participants from all sources may not exceed 100 percent of the costs of the practices implemented,
- Making an annual rental payment under the CRP contract for each eligible acre enrolled under the NCV CREP,
- Providing an annual maintenance payment for each acre enrolled in the same manner as with normal CRP contracts,
- Providing eligibility and enrollment information to landowners concerning CREP and providing technical assistance for CREP,
- Sharing appropriate data with the State of California to facilitate State monitoring efforts, and
- Documenting compliance of individual CREP contracts with NEPA.

For its roll in the NCV CREP, NRCS will (Amendment 2005):

- Participate in State-level technical determinations and policy reviews, such as evaluating ranking criteria, cost-share policies, and other requirements;
- Determine environmental ranking based on State ranking criteria and record necessary determinations on State ranked worksheets;
- Assist County Offices and participants in identifying soil types for calculating maximum payment rates on non-irrigated land;
- Determine eligibility of the acres offered;
- Develop an approved conservation plan;
- Assist participants to ensure that practice specifications are met; and
- Assist FSA with:
    - Final eligibility determinations,
    - Completing the CRP-2C,
    - Certification of practice completion, and
    - Completing annual status reviews.

State Commitments

For its roll in the NCV CREP, the State of California will (Amendment 2005):

- Contribute no less than 20 percent of the overall program costs for the NCV CREP;
- Pay at least 50 percent of the eligible reimbursable costs of riparian buffer establishment under this CREP. (In no case will combined payments from all sources exceed 100 percent of the total cost of establishing the practice);
- Acquire perpetual conservation easements on land approved for enrollment under the wetland restoration element of CREP. The easement enrollments will be evaluated and ranked separately from the remainder of CREP offerings and, although an integral part of CREP, will be administered solely by the State. There will be no CRP contracts for these enrollments.
- Pay all costs associated with an annual wildlife-monitoring program of CREP enrolled acreage;

- Provide technical assistance in the development of conservation plans, including establishment of the identified practices;
- Assist FSA in the development and implementation of a broad campaign for continuous public information and education regarding CREP;
- Hire a CREP State coordinator to work directly with the staff of USDA, California, and the non-governmental partners involved in the project to ensure effective delivery of the subject CREP; and
- Prepare an annual report to the Deputy Administrator for Farm Programs, FSA within 60 days of the end of the Federal fiscal year which includes, at a minimum, level of program participation, the results of the annual monitoring program, and the summary of non-Federal CREP expenditures.

2.3 Comparison of Alternatives

The two alternatives both respond to project objectives in varying degrees. Implementing either alternative also has specific environmental implications for the State's watersheds. Tables 2.5 and 2.6 provide a summary comparison of the alternatives. To provide consistency, the following impact terminology will be used in the comparison table below and throughout the document.

- No Effect – A change to a resource's condition, use, or value that is not measurable or perceptible.
- Beneficial Effect – An action that would improve the resource's condition, use, or value compared to its current condition, use, or value.
- Minor Adverse Effect – A measurable or perceptible, minor, localized degradation of a resource's condition, use, or value that is of little consequence.
- Moderate Adverse Effect – A localized degradation of a resource's condition, use, or value that is measurable and of consequence.
- High Adverse Effect – A measurable degradation of a resource's condition, use, or value that is large and/or widespread and could have permanent consequences for the resource.
- Short-term Effect – An effect that would result in the change of a resource's condition, use, or value lasting less than one year.
- Long-term Effect – An effect that would result in the change of a resource's condition, use, or value lasting more than one year and probably much longer.

Table 2.5. Summary comparison of achievement of project objectives of Alternatives A and B.

Objectives	Indicators	Alternative A: No Action	Alternative B: Implement CREP
Objective #1: Improve wildlife habitat for breeding waterfowl	Increase average nest densities to 0.45 nests per acre and increase nest success by 25 percent on CREP properties resulting in hatching 10,125 additional ducklings each spring. Nest densities to an average of one nest per acre and increase nest success by 30 percent in areas adjacent to pair and brood water resulting in hatching 20,000 additional ducklings each spring. Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats. Implementation of FSA CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.	Land currently in crop production would remain cultivated. No new wildlife habitat would be created. No native or other beneficial plants would be planted on existing cropland.	Up to 10,500 acres of marginal cropland would be enrolled in CPs, providing upland, wetland, and riparian habitat on previously cultivated fields. Development of upland cover/wetland (brooding area) complexes would increase habitat diversity in areas of intense rice cultivation and result in parallel increases of various wildlife populations.
Objective #2: Improve wildlife habitat for ring-necked pheasants	Two pheasants per acre on CREP enrolled uplands resulting in 20,000 additional pheasants annually. Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats. Implementation of FSA CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.	Land currently in crop production would remain cultivated. No new wildlife habitat would be created. No native or other beneficial plants would be planted on existing cropland.	Up to 10,500 acres of marginal cropland would be enrolled in CPs, providing upland, wetland, and riparian habitat on previously cultivated fields. Development of upland cover/wetland (brooding area) complexes would increase habitat diversity in areas of intense rice cultivation and result in parallel increases of various wildlife populations.
Objective #3: Improve wildlife habitat for grassland birds	Establish detectable numbers of individuals of certain targeted species. Develop specific population goals for future management efforts. Collect first-time quantitative and comparative baseline data on breeding bird densities on upland set-aside habitats. Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats. Implementation of FSA CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.	Land currently in crop production would remain cultivated. No new wildlife habitat would be created. No native or other beneficial plants would be planted on existing cropland.	Up to 10,500 acres of marginal cropland would be enrolled in CPs, providing upland, wetland, and riparian habitat on previously cultivated fields. Development of upland cover/wetland (brooding area) complexes would increase habitat diversity in areas of intense rice cultivation and result in parallel increases of various wildlife populations.
Objective #4: Improve water quality and conserve soil	Establishment of upland cover in cropland areas subject to erosion. Retire 10,500 acres of marginal cropland and revegetation of former grasslands, wetlands, and riparian habitats. Implementation of FSA CP1, CP2, CP4D, CP9, CP10, CP12, CP21, and CP22.	Land currently in crop production would remain cultivated. No new wildlife habitat would be created. No native or other beneficial plants would be planted on existing cropland.	Once CP installation CPs is complete, enrolled land would not be plowed, reducing susceptibility to water and wind erosion. Land enrolled in riparian buffers would be planted such that sloughing and other water erosion would not occur.

Table 2.6. Effect comparison of Alternatives A and B on relevant resource issues.

Issues	Alternative A: No Action	Alternative B: Implement CREP
Issue #1: Surface Water susceptibility to agricultural practices.	Long-term, moderate adverse effect – Surface water quality would continue to decline from pollutant loads in agricultural runoff. Demand for irrigation water would remain at current levels or possibly increase if drought conditions continue, resulting in less surface water in the project area.	Implementation of CREP would provide long-term, moderate to high beneficial effects to surface water quality and quantity. Water quality will be improved by reducing erosion and nonpoint pollution adjacent to streams and rivers. Removal of land from active agricultural production would result in fewer applications of fertilizers and pesticides to cropland, reducing pollutant loads in agricultural runoff that discharges into surface waters. Land enrolled in CREP would be removed from irrigation which would result in less surface water being diverted for irrigation and less groundwater pumping. Streamflow in reaches hydrologically connected to aquifers would increase with the decrease in groundwater pumping.
Issue #2: Groundwater susceptibility to agricultural practices.	Long-term, moderate adverse effect – Current agricultural practices would continue, and groundwater quality and quantity would continue to decline. Polluted agricultural runoff would continue to degrade groundwater quality, and current irrigation practices would continue to deplete groundwater resources.	Implementation of Alternative B would result in moderate to high beneficial long-term effects to groundwater. Converting cropland to CPs would remove land from active agricultural production, reducing consumptive use of groundwater and potentially increasing aquifer levels. Groundwater recharge would also improve with the establishment of native plants. Native plants require less water for growth, resulting in more percolation of precipitation into the groundwater. The retirement of 10,500 acres of land from active agricultural practices would result in less fertilizers and pesticides being applied and groundwater recharge from land enrolled in CREP is expected to be of higher quality than recharge from previously cropped land.
Issue #3: Drinking Water susceptibility to agricultural practices.	Long-term, minor adverse effect – Drinking water quality would continue to decline. State and Federal laws would continue to prevent major discharges that would significantly degrade drinking water resources, but incremental negative impacts from agricultural and industrial activities would continue.	The implementation of CREP would result in long-term, minor to moderate beneficial effects on drinking water. Either indirectly or directly, each of the CPs improves surface water quality and potentially could improve the quality of water that recharges groundwater.
Issue #5: Wetland susceptibility to agricultural practices.	Long-term, moderate adverse effect – Wetland values would continue to slowly decline because of existing and projected agricultural runoff. Total wetland acres will likely be stable or slightly reduced.	Long-term, moderate beneficial effect – Wetland acreage would likely increase and help create new wildlife habitat for traditional species in the combined watersheds.

Issues	Alternative A: No Action	Alternative B: Implement CREP
Issue #6: Floodplain susceptibility to agricultural practices.	No effect – Since floodplains are routinely used for agricultural production which normally has little adverse effect on flowage areas or floodways, these effects are considered to be negligible.	Minor long-term improvements would be made to floodplains and stream values. CPs would assist in controlling flood events.
Issue #7: Biological Resources susceptibility to agricultural practices.	Long-term, minor adverse effect – Wildlife and plant values would not benefit from the leveraged effects of habitat restoration and watershed improvement CPs and may continue to decline.	Long-term, moderate beneficial effect – CPs would improve habitat values. Improvements to water quality alone would have beneficial effects for all wildlife as well as potential increases in critical habitat. The pervasive loss of upland habitat has affected upland species. CPs would convert agricultural land into viable nesting and foraging habitat for marginal and important species.
Issue #8: Cultural / Tribal susceptibility to agricultural practices.	Without a mandated assessment process, minor to moderate adverse impacts would continue to occur on cultural resources. These include disturbance and destruction of prehistoric and historic sites and structures, either through ongoing land conversion for development or agricultural use.	Minimal to no impact would occur. If cultural resources are discovered on enrolled lands, coordination with the SHPO and/or THPO and tribes would occur to minimize impacts. Some CPs may serve to protect inappropriate access to cultural resources.
Issue #9: Environmental Justice impacts from agricultural practices.	No FSA actions are required or necessary to address existing or ongoing issues with environmental justice.	Disproportionate effects on minority or underrepresented groups are unlikely.
Issue #9: Human health, social, and economic impacts from agricultural practices.	Long term, minor adverse effect – Agricultural practices will continue, including chemical applications that may affect farm worker health. Recreation benefits resulting from CREP would not occur. State and local economy would likely not be affected.	Long-term, minor beneficial effect – By enrolling marginal, less productive agricultural lands, landowners should be able to reduce overall input costs for farming operations and maintain or increase production by being able to concentrate resources on the remaining farmland. Possible recreation and economic benefits from CP implementation would occur.
Issue #10: Air Quality susceptibility to agricultural practices.	Long-term minor impact—Traditional agricultural practices will continue. Smoke from the burning crops would continue to impact air quality of the area. Land in crop production will continue to be disturbed, increasing soil exposure to dry and windy conditions resulting in dust.	Long-term minor effect – Traditional plowing of cultivated land would not be practiced, preventing exposure of soil to water and wind erosion. Smoke from crop burning would not occur from land enrolled in CPs.

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Chapter 3.0 Affected Environment and Environmental Consequences

3.1 Introduction

The analyses of Affected Environment and Environmental Consequences have been combined in this section to simplify the document. Relevant resource issues related to the NCV CREP Agreement are discussed below in Sections 3.5 through 3.12. This section will explore the environmental resources affected by the No Action Alternative and the Proposed Action Alternative (Implementation of the NCV CREP).

This chapter discusses the resources most likely to receive impacts from the alternatives, and compares the impacts of the alternatives on the resource issue. Resources discussed in this chapter include:

- Surface Water (3.5)
- Groundwater (3.6)
- Drinking Water (3.7)
- Wetlands (3.8)
- Floodplains (3.9)
- Biological Resources (3.10)
- Cultural/Tribal Resources (3.11)
- Environmental Justice (3.12)
- Human Health, Social, and Economic Issues (3.13)
- Air Quality (3.14)

This chapter also discusses mandatory impact considerations including:

- Cumulative Effects (3.15)
- Unavoidable adverse impacts (3.16)
- Relationship of short-term uses and long-term productivity (3.17)
- Irreversible and irretrievable commitments of resources (3.18)

The general nature of this PEA limits discussion of the resources to a wide scale. An in depth, site specific environmental review would be completed by FSA for each CREP contract as part of the conservation planning process. As impacts become clear at each site, the appropriate steps would be taken to ensure compliance with NEPA and related environmental and cultural resource laws and regulations. Consultations will be initiated, as appropriate, depending on the resources potentially affected by the proposed action. If necessary, site specific EAs would be completed.

3.2 General Description

3.2.1 Ecoregions

The NCV CREP project area is contained in the Central California Valley ecoregion, characterized by flat, intensively farmed plains. Nearly half of the region is in cropland, about three fourths of which is irrigated. Environmental concerns in the region include salinity resulting from evaporation of irrigation water, groundwater contamination from heavy use of agricultural chemicals, wildlife habitat loss, and urban sprawl (EPA 2005).

3.2.2 Climate

The climate of the project area is Mediterranean, typified by cool, wet, winters and hot, dry summers. Precipitation, primarily in the fall and winter, is almost exclusively in the form of rainfall and average 17.5 inches per year (Proposal 2000).

3.2.3 Soils

Soil associations vary greatly within the project area. The majority of lands eligible for enrollment in CREP are expected to occur in the various basins with soils primarily of level to nearly level, moderately deep, moderate to poorly drained clays and clay loams that are currently used for rice production or low value row crops such as wheat, sugar beets, and safflower (Proposal 2000).

3.2.4 Geology

The project area can be characterized as a broad, nearly level valley bordered by sloping alluvial fans, slightly dissected terraces, and foothills. Major landforms of the Central Valley include basins, basin rims, low terraces, dunes, and high terraces. Basin is a generic term for nearly level alluvial flats which accumulate sediments. Basin rims border the basins, and are typified by mound-depression micro-relief. Low terraces contain late Pleistocene-age geomorphic surfaces underlain by stream alluvium. These nearly level surfaces are more that 10,000 years old. High terraces are the oldest alluvial surfaces in the Central Valley, and lie topographically above low terraces (Proposal 2000).

3.2.5 Land Uses and Land Ownership

Agriculture is the primary land use within the project area. The area includes approximately 4,162 farms, with the average farm size of 305 acres. Rice production accounts for 39 percent of agricultural production, with row crops (e.g., wheat, cotton, tomatoes, sugar beets) producing 25 percent, orchards producing 25 percent, and hay/alfalfa producing 11 percent (Proposal 2000).

Most Central Valley counties have relatively little government-owned land. Land on the Valley floor is predominantly farmland and is almost entirely in private ownership. Most of the government-owned land in the Central Valley counties is foothill and mountain areas, and much of it extends into the Sierra Nevada range. In the counties of the NCV CREP, 73 percent of the land is privately owned (Umbach 1997).

3.3 Profile of Agricultural Activities (Baseline Conditions)

California is, by far, the number one agricultural producer and exporter in the U.S. See Table 3.1 for a breakdown of the production of the top five agricultural States. In 2003, agricultural marketings of the State's farmers and ranchers reached $27.8 billion, with $7.2 billion in international exports. California produces over 350 different crops and more than half the nation's total of fruits, nuts, and vegetables. Many commodities grown in California are specialty crops produced almost solely in the State, including artichokes, brussels sprouts, almonds, dates, figs, kiwifruit, nectarines, olives, pistachios, dried plums, and walnuts (CASS 2004).

California has 78,500 farming operations, producing 13 percent of the national gross cash receipts from farming. In 2003, land in farms totaled 27.1 million acres. The average farm size in the State is 345 acres (CASS 2004).

Table 3.1. Top five agricultural States in the U.S. and their cash receipts of 2003.

State	Rank	Total Value (Billion Dollars)
California	1	27.8
Texas	2	15.3
Iowa	3	12.6
Nebraska	4	10.6
Kansas	5	9.0

Source: CASS 2004.

The Central Valley of California is one of the most important agricultural regions in the world, producing over 250 different crops. However, the CREP project area is generally characterized by basin clay soils and much lower crop production values than the more fertile San Joaquin Valley segment of the Central Valley. Only 25 percent of the Central Valley's agricultural production comes from the nine counties in the CREP project area (Proposal 2000).

Although agriculture is in the NCV is not as significant as other areas in the State, farmland accounts for over 54 percent of the total land in the nine counties within the NCV CREP The majority of the region in currently in rice production, with in excess of 513,000 acres of rice planted in 2002 (NASS 2002). In 2003, agricultural production value for the nine counties was over $2 billion (CASS 2004). Table 3.2 details the value of agricultural production of the NSV CREP counties in 2003.

Table 3.2. Leading commodities, total value, and county rank of agricultural production in 2003.

County	Rank[1]	Total Value (x $1,000)	Leading Commodities
Butte	21	332,146	Rice, Almond, English Walnuts, Dried Plums, Nursery Stock
Colusa	20	332,146	Rice, Almond Meats, Processing Tomatoes, Cattle and Calves, Rice Seed
Glenn	23	318,032	Paddy Rice, Almonds, Dairy Products, Cattle and Calves, Walnuts
Placer	39	66,419	Milling Rice, Nursery Products, Cattle and Calves, Livestock and Products, Irrigate and Range Pasture
Sacramento	27	274,500	Wine Grapes, Market Milk, Nursery Products, Bartlett Pears, Poultry
Solano	30	214,123	Nursery Stock, Cattle and Calves, Processing Tomatoes, Alfalfa, Feeder Lambs
Sutter	26	301,230	Rice and Rice Seed, Peaches, Dried Plums, Walnuts, Tomatoes
Yolo	25	304,401	Processing Tomatoes, Rice, Wine Grapes, Alfalfa Hay, Seed Crops
Yuba	32	146,493	Rice, Clingstone Peaches, Dried Plums, Walnuts, Cattle and Calves

[1] Rank = State rank in 2003.
Source: CASS 2004.

3.4 Leveraged Benefits

An understanding of the planned effect of the 10,500 acres proposed for the NCV CREP is essential to the discussion of resource impacts. The reason for this discussion is that a one-to-one comparison of acreage impacts is not a valid assumption for analysis due to the anticipated uses of the CREP acreage. The impacts of one acre added to CREP are not equal to only one acre of the watershed being benefited by the nutrient reduction or conversion to a riparian buffer strip. Land enrolled in CREP is expected to have a positive impact on additional adjacent acres. For example, implementation of grass filter strips and/or riparian buffers on CREP land would have the expected benefit of intercepting agricultural runoff from several acres of adjacent non-CREP land reducing the overall sediment and nutrient loads delivered to the receiving waters.

Specific impacts and the degree to which the CPs can be effective will depend on site specific analysis of each CREP contract. Acreage is limited for some of the CPs, yet the overall benefits are measured as impacts to larger acreage. Mitigation measures are in place and outlined steps would be followed to ensure compliance with NEPA and other Federal regulations for each implementation area.

3.5 Surface Water Resources

3.5.1 Introduction

Surface water resources in the NCV CREP project area are important for a number of uses including agriculture, recreation, and fish and wildlife. This section will discuss surface water quality and quantity and how they are affected by current agricultural practices in the proposed CREP project area.

Surface Water Quality

Water allocation and water quality protection in California is administered by the State Water Resources Control Board (SWRCB). The SWRCB is responsible for complying with the CWA., which requires States to report on water quality of waterbodies located within the States and their attainment of beneficial uses (SWRCB 2005a). Under Section 303(d) of the CWA, States are required to identify and establish a priority ranking of all waterbodies that are not meeting State water quality standards and to biennially develop a Water Quality Limited Segments List (commonly called a 303(d) List). Section 303(d) requires a Total Maximum Daily Load (TMDL) for waters that do not meet State water quality standards. A TMDL is described as a “pollution budget” for a specific river, lake, or stream, and is an established wasteload allocation for point and non-point sources. On July 25, 2003, the U.S. Environmental Protection Agency (EPA) gave final approval to California's 2002 Section 303(d) List of Water Quality Limited Segments (SWRCB 2005b).

Every two years, the SWRCB submits a report on the State's water quality to EPA pursuant to Section 305(b) of the CWA. The 305(b) report describes the status and trends of existing water quality, the extent to which designated uses are supported, pollution problems and sources, and the effectiveness of the water pollution control programs. Water quality assessment information from California's nine Regional Water Quality Control Boards (RWQCBs) has been compiled and presented in the format requested in EPA 's 1998 305(b) Guidelines (SWRCB 2005c).

The Porter-Cologne Water Quality Control Act, contained in Division 7 of the California Water Code (CWC), establishes the responsibilities and authorities of each RWQCB, including authority and responsibility for regional water quality control and planning. The RWQCB establishes water quality objectives and programs to implement those objectives by amending the Central Valley Region’s Water Quality Control Plan for the Sacramento and San Joaquin River Basins (CVRWQCB 2005a). The mission of the RWQCBs is to develop and enforce water quality objectives and implementation plans

which will best protect the beneficial uses of the State's waters, recognizing local differences in climate, topography, geology, and hydrology. The CREP project area is located in Region 5, Central Valley Region (SWRCB 2005a).

3.5.2 Existing Conditions

The NCV CREP project area is located in the lower Sacramento River watershed. The Sacramento River is the largest river in California, with an average annual runoff of 22 million acre-feet. This is approximately one third of the total runoff in the State. The length of the Sacramento River is 327 miles. The river is vital to the State's economy and is a major source of drinking water for residents of northern and southern California. The Sacramento River is a principal source of irrigation water for Sacramento and San Joaquin Valley farmers and freshwater flow to the San Francisco Bay (USGS 2005a).

The Sacramento River drains the northern part of the Central Valley. The Sacramento River watershed covers 27,210 square miles, which includes over 50 sub-basins and tributaries. The principal streams located in the eastern half of the Sacramento River watershed are (CVRWQCB 2005a):

- Pit River
- Feather River
- Yuba River
- Bear River
- American River

Major streams located in the western half include:

- Cottonwood Creek
- Stony Creek
- Cache Creek
- Putah Creek

Major reservoirs and lakes of the Sacramento River watershed include:

- Shasta
- Oroville
- Folsom
- Clear Lake
- Lake Berryessa

The remaining inputs (approximately 25 percent of the flow) come from streams entering from smaller watersheds along the river and from agricultural and storm drain systems. The Sacramento River basin supplies more than 80 percent of the fresh water flows to the Sacramento-San Joaquin Delta (CVRWQCB 2005a).

Major surface water uses in the Sacramento River watershed include irrigation, drinking water, aquaculture, and mining (CVRWQCB 2005a). The major use of surface water in the CREP project area is for irrigation (90 percent), followed by public supply (7 percent) (USGS 2005b). Water use for each CREP county is summarized in Table 3.3.

Table 3.3. Surface water withdrawals by water-use category, 2000[1].

Water Use Category	CREP County									CREP County Total	California
	Butte	Colusa	Glenn	Placer	Sacramento	Solano	Sutter	Yolo	Yuba		
Public Supply Fresh	17.9	0.0	0.0	56.5	172.9	59.9	9.7	9.7	0.5	**327.2**	**3,320**
Domestic Supply Fresh	0.3	0.1	0.1	0.2	0.5	0.1	0.2	0.3	0.2	**1.7**	**28.6**
Irrigation Fresh	687.2	626.1	447.8	93.8	257.3	337.5	653.7	691.3	271.9	**4,066.7**	**18,900**
Livestock Fresh	0.3	0.3	1.8	1.0	2.4	0.6	0.1	0.2	0.6	**7.3**	**227**
Aquaculture Fresh	35.1	0.1	0.0	0.0	46.9	0.0	0.0	0.0	0.0	**82.1**	**380**
Aquaculture Saline	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	**0.1**	**13.6**
Mining Fresh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	**0.1**	**2.71**
Total Withdrawals Fresh	**740.9**	**626.6**	**449.7**	**151.4**	**479.9**	**398.1**	**663.8**	**701.6**	**273.2**	**4,485.1**	**23,200**
Total Withdrawals Saline	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.1**	**12,600**
Total Withdrawals	**740.9**	**626.6**	**449.7**	**151.4**	**479.9**	**398.1**	**663.8**	**701.6**	**273.2**	**4,485.2**	**35,800**

[1]Figures may not sum to totals because of independent rounding. All values are in million gallons per day.
Source: USGS 2005b.

Hydrology

Hydrologically, the Sacramento Valley is a highly managed area with reservoirs on all the major tributaries of the lower Sacramento River used for water supply and flood control. The river also has diversions for municipal and agricultural uses and levies and bypasses for additional flood control. Areas in the historic floodplains of the Sacramento and Feather Rivers reclaimed by these hydrologic manipulations are now highly productive agricultural lands and urban areas (CVRWQCB 2005b).

In addition to the natural hydrologic processes of rainfall runoff, snowmelt, and base flow from groundwater discharge, the flows in the lower Sacramento and Feather rivers are greatly affected by reservoir releases, water diversions, irrigation return flows, and diversions through bypasses. Reservoirs are used for water supply and flood control on all of the major tributaries of the lower Sacramento River (CVRWQCB 2005b). The lower Sacramento River watershed contains over 5,700 miles of waterbodies receiving greater than 50 percent of the flow from agricultural discharges during a significant portion of the irrigation season (SWRCB 2005c). When used to prevent flooding during high flows, both the Sutter and Yolo bypasses have a larger water carrying capacity than the Sacramento River channel (CVRWQCB 2005b).

Water Quality

Surface water quality in the watershed is generally good, making the Sacramento River one of the most desirable water sources in the State. However, pesticides and sediment enter the watershed from a variety of sources and can impact beneficial uses such as fisheries and drinking water supplies. For example, the decline of fisheries in the Sacramento River is partially related to water quality problems on the Sacramento River main stem including: unsuitable water temperature resulting from water releases from upstream reservoirs, toxic heavy metals (such as mercury, copper, zinc, and cadmium) from acid mine drainage, pesticides and fertilizer in agricultural and urban runoff, and degraded spawning gravels from sedimentation (CVRWQCB 2005a).


Sacramento River at Freeport, California. Photo Courtesy of USGS.

303(d) List

In the CREP project area, there were a number of waterbodies listed on the 2002 303(d) list. The majority of these waterbodies have been listed for pesticides and/or metals (SWRCB 2005b). The main pesticide source is agricultural land use or urban runoff. Waterbodies listed on the 303(d) list are summarized in Tables 3.4 and 3.5. Currently, a TMDL for orchard pesticides and diazinon is being established for the Sacramento and Feather River reaches that are listed as high priority in Table 3.4.

Table 3.4. Summary of rivers and streams in the CREP project area listed on the 2002 303(d) list.

TMDL Priority	Rivers/Streams	Pollutants	Pollutant Sources
High	Arcade Creek; Chicken Ranch Slough; Elder Creek; Elk Grove Creek; Feather River, Lower Morrison Creek; Sacramento River (Knights Landing to the Delta); Strong Ranch Slough	Diazinon Chlorpyrifos	Agriculture Urban Runoff/Storm Sewers
Medium	Bear River, Lower; Butte Slough; Cache Creek, Lower Colusa Basin Drain; Feather River, Lower; Jack Slough; Sacramento River (Knights Landing to the Delta); Sacramento Slough; Sutter Bypass	Azinphos-methyl Diazinon Mercury	Agriculture Urban Runoff/Storm Sewers Resource Extraction Crop-Related Sources
Low	American River, Lower; Arcade Creek; Cache Creek, Lower Colusa Basin Drain; Feather River, Lower; Natomas East Main Drainage Canal (Steelhead Creek, upstream of confluence with Arcade Creek); Putah Creek, Lower; Sacramento River (Red Bluff to Knights Landing); Sacramento River (Knights Landing to the Delta); Sacramento Slough	Unknown Toxicity Copper Group A Pesticides PCBs Mercury Carbofuran/Furadan Malathion Methyl Parathion Molinate/Odram	Agriculture Source Unknown Urban Runoff/Storm Sewers Industrial Point Sources Resource Extraction Agriculture-irrigation tailwater

Source: SWRCB 2005b.

Table 3.5. Summary of lakes and reservoirs in the CREP project area listed on the 2002 303(d) list.

TMDL Priority	Lakes/Reservoirs	Pollutants	Pollutant Sources
Medium	Black Butte Reservoir	Mercury	Resource Extraction
Medium	Camp Far West Reservoir	Mercury	Resource Extraction

Source: SWRCB 2005b.

Pesticides

The main agricultural impact to surface water quality in the Sacramento Valley results from pesticide application on cropland. In the CREP project area, over 90 percent of streams and rivers are listed on the 2002 303(d) list for a number of pesticides including organophosphate pesticides (Table 3.4) and a major source of these pesticides is agricultural use. In the Sacramento River, watershed reduction of pesticides in agricultural runoff continues to be a high priority issue (CVRWQCB 2005a). Other sources of pesticides in the Sacramento Valley include golf courses and urban areas.

The Sacramento River and its tributaries have been included in the CWA 303(d) list as impaired because of elevated levels of diazinon causing toxicity to Ceriodaphnia. The main source of the diazinon is from orchards and urban areas. In the Sacramento Valley, diazinon is used to exterminate destructive pests and insects such as aphids, spider mites, fleas, ants, roaches, and boring insects. A fraction of urban and agricultural diazinon applications can reach surface water through a variety of methods including during rainfall or irrigation events, when residual diazinon migrates with stormwater runoff; by irrigation return flow; or by aerial drift. Diaxinon can then enter tributaries that flow into the Sacramento and Feather rivers (CVRWQCB 2005b). There are no water quality objectives for diazinon; however, CDFG has developed criterion that is routinely exceeded in (1) urban creeks during storm events and (2) Sacramento and Feather rivers following storm events during the dormant spray period (CVRWQCB 2005b).

In addition to diazinon, the Sacramento River has elevated concentrations of organochlorine compounds, including Polychlorinated Biphenyls (PCBs), Dichlorodiphenyltrichloroethane (DDT) and its metabolites Dichlorodiphenyldichloroethane (DDD) and Dichlorodiphenyldichloroethylene (DDE), toxaphene, and chlordane. Organochlorine pesticides in the Sacramento River are thought to result primarily from past agricultural use because of the current ban on chlordane, DDT, and toxaphene (CVRWQCB 2005a).

3.5.3 Effects of Alternative A (No Action) on Surface Water

Implementation of Alternative A would result in long-term, moderate adverse effects to surface water resources. Surface water quality would continue to decline under Alternative A. Agricultural runoff introduces contaminants into surface water and any improvements in water quality would be dependant upon existing and proposed programs.

Selection of Alternative A would not contribute to achieving any of the CREP Objectives listed in Section 1.4.

3.5.4 Effects of Alternative B (CREP Agreement) on Surface Water

Implementation of Alternative B would provide long-term, moderate to high beneficial effects to surface water quality and quantity. Alternative B would result in positive localized improvements to water quality and would help waterbodies achieve and meet State water quality standards. Additionally, acres enrolled in CREP would be removed from irrigation which would result in improvements to water quantity.

Improvements to water quality would come from the installation of all of the Approved CPs. For example, CP21 and CP22 (filter strips and riparian buffers) are effective in removing waterborne pathogens, nutrients and pesticides, thereby reducing the amount of the contaminants in agricultural runoff. Riparian buffers also create shade to lower water temperature to improve habitat for aquatic organisms; provide a source of detritus and large woody debris for aquatic organisms; help stabilize and restore damaged stream banks; and reduce erosion of stream banks. CP2 restores native plant communities reducing soil erosion and sediment loads to receiving waters. Additionally, land enrolled in approved CPs would not receive pesticide and nutrient applications, which would reduce pollutant loads in agricultural runoff from previously cropped land.

Activities associated with the implementation of CPs could potentially result in short-term, adverse impacts to surface water quality and quantity. These activities and their impacts are summarized below:

- Site preparation— CP establishment could require site preparation activities including building physical structures such as dikes and clearing enrolled land of undesirable plant species using chemicals such as herbicides and/or physical methods such as burning, discing, and plowing.
- Establishment of desirable plants and controlling invasive species or noxious weeds—Until desired plants are established, acres enrolled in CREP may be irrigated, potentially affecting water quantity.
- Maintenance of CPs—Maintaining CPs on enrolled CREP land may include additional shifting soil to repair dikes or buffer strips, applying herbicides and/or pesticides to control invasive species, or irrigating land during critical growing periods of drought years.

A conservation plan for each CP would be prepared and Best Management Practices (BMPs) will be used to mitigate any adverse impacts of implementing specific CPs. These impacts are expected to only last until the CP is permanently established and are considered minor compared to the overall long-term benefits of the CPs. These temporary impacts could be expected to last anywhere between 1-3 years.

The beneficial impacts of the CPs discussed above would provide long-term moderate to high beneficial effects, assisting in the achievement of all four CREP Objectives (Section 1.4).

3.6 Groundwater

3.6.1 Introduction

Currently, California does not have a uniform statewide program for the management of groundwater. The management of groundwater use is a local responsibility accomplished under the authority of the CWC (CALFED 2000).

The quality of California's groundwater resources is the concern of more than one agency. Each of these agencies, at the State and Federal levels, approaches groundwater issues from a unique perspective, based on its individual mandate. The State agencies that implement groundwater-related monitoring and assessment programs are the SWRCB and RWQCBs, DWR, California Department of Health Services (DHS), Department of Toxic Substances Control, and Department of Pesticide Regulation. Federal agencies that implement groundwater-related monitoring and assessment programs include EPA and the U.S. Geological Survey (USGS) (SWRCB 2005c).

3.6.2 Existing Conditions

Groundwater is the water occurring beneath the earth’s surface that completely fills the empty space of rocks or sediment. Most of California’s groundwater occurs in material deposited by streams, called alluvium. Alluvium consists of coarse deposits, such as sand and gravel, and finer-grained deposits such as clay and silt. The coarse and fine materials are usually coalesced in thin lenses and beds in an alluvial

environment. In this environment, coarse materials such as sand and gravel deposits usually provide the best source of water and are termed aquifers; whereas, the finer-grained clay and silt deposits are relatively poor sources of water and are referred to as aquitards (DWR 2005b). The CREP project area is located in the Sacramento Valley aquifer.

The Sacramento Valley aquifer occupies a structural trough surrounded by the Sierra Nevada, Cascade, and Coast Range mountains and is made up of thousands of feet of sediment eroded from the surrounding mountains. Fresh water occurs to depths of about 2,000 feet below sea level in the Sacramento Valley; below these depths the aquifer contains saline water. Saline water also occurs in fresh water parts of the Sacramento Valley aquifer as either perched zones or upward extensions of the deeper water (Dawson 2001).

In California, a groundwater basin is defined as an alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and a definable bottom. Lateral boundaries are features that significantly impede groundwater flow such as rock or sediments with very low permeability or a geologic structure such as a fault. Bottom boundaries would include rock or sediments of very low permeability if no aquifers occur below those sediments within the basin. In some cases, such as in the San Joaquin and Sacramento Valleys, the base of fresh water is considered the bottom of the groundwater basin (DWR 2005b).

A subbasin is created by dividing a groundwater basin into smaller units using geologic and hydrologic barriers or, more commonly, institutional boundaries. These subbasins are created for the purpose of collecting and analyzing data, managing water resources, and managing adjudicated basins. As the definition implies, the designation of a subbasin boundary is flexible and could change in the future. The limiting rule for a subbasin is that it should not cross over a groundwater basin boundary (DWR 2005b). The CREP project area includes 13 subbasins located within the larger Sacramento Valley groundwater basin (DWR 2005b). Subbasins located in the CREP project area are:

- Corning
- Colusa
- Vina
- West Butte
- East Butte
- North Yuba
- South Yuba
- Sutter
- North American
- South American
- Solano
- Yolo
- Capay Valley

Groundwater Use

Groundwater provides about 31 percent of the water supply for urban and agricultural uses in the Sacramento River watershed and has been developed in both the alluvial basins and the hard rock uplands and mountains. The reliability of the groundwater supply varies greatly. The Sacramento Valley is recognized as one of the foremost groundwater basins in the State; wells developed in the sediments of the valley provide excellent supply to irrigation, municipal, and domestic uses. Many of the mountain valleys of the region also provide significant groundwater supplies to multiple uses (DWR 2005b). Groundwater provides all or a portion of municipal supply in many valley towns and cities throughout the watershed. Domestic use of groundwater varies, but in general, rural unincorporated areas rely completely on groundwater (CVRWQCB 2005a).

According to USGS water use estimates for 2000, the dominant use of groundwater in CREP counties is irrigation (86 percent), followed by public supply for drinking water (11 percent) (USGS 2005b). Table 3.6 summarizes groundwater use in CREP counties for 2000.

Table 3.6. Groundwater withdrawals by water-use category, 2000.[1]

Water Use Category	CREP County									CREP County Total	California
	Butte	Colusa	Glenn	Placer	Sacramento	Solano	Sutter	Yolo	Yuba		
Public Supply Fresh	27	3	4	3	130	10	6	31	11	**225**	**2,800**
Domestic Supply Fresh	3	0	1	2	4	1	1	2	1	**16**	**257**
Irrigation Fresh	286	283	227	32	152	108	251	291	86	**1,716**	**11,600**
Livestock Fresh	0	0	1	1	2	0	0	0	1	**6**	**182**
Aquaculture Fresh	20	0	0	0	7	0	0	0	0	**28**	**158**
Industrial Fresh	0	0	1	0	8	1	0	2	0	**12**	**183**
Total Withdrawals Fresh	**337**	**287**	**234**	**38**	**303**	**120**	**258**	**326**	**99**	**2,003**	**15,200**

[1]Figures may not sum to totals because of independent rounding. All values are in million gallons per day.
Source: USGS 2005b.

Groundwater Quantity

In general, in the Sacramento River watershed well yields are good and range from one-hundred to several thousand gallons per minute. Because surface water supplies are abundant in the valley, agricultural use of groundwater is primarily to supplement surface water supplies. With the changing environmental laws and requirements, this balance is shifting to a greater reliance on groundwater, and conjunctive use of both supplies is occurring to a greater extent throughout the valley, particularly in drought years. Most of the rivers and streams of the area have adjudicated water rights that go back to the early 1900s and diversion of surface water has historically supported agriculture. Recently, droughts and increased competition for supply have led to significant development of groundwater for irrigation (CVRWQCB 2005a).

Prior to development, aquifer recharge to the Sacramento Valley Basin was mainly from infiltration along streambeds and from subsurface inflow along basin boundaries. Groundwater discharge occurred mainly as evapotranspiration and loss to surface water. With the introduction of agriculture to the region, both recharge and discharge of groundwater have increased over natural conditions. Seepage from irrigation canals and deep percolation of applied irrigation water now contributes to recharge of groundwater and groundwater pumping in the southern part of Sacramento Valley contributes to increased discharge (CALFED 2000 and Dawson 2001).

Groundwater Quality

Natural groundwater quality is generally excellent in most of the Sacramento Valley and is suitable for most uses; however, groundwater contamination has been detected in some areas of the watershed

(CALFED 2000). Contaminants include nitrates, pesticides, and arsenic. Nitrates and pesticides since they can be linked to agricultural practices in the watershed are discussed in more detail below.

Nitrates

There are roughly 300 square miles of groundwater in the Sacramento River watershed with elevated levels of nitrates. The primary areas of concern are in the vicinity of Chico and much of Sutter County. Less severe impacts are found in the vicinity of Knights Landing, Arbuckle, Yuba City, and Willows. Affected subbasins include Butte and Colusa subbasins (CALFED 2000). Many counties in the watershed depend extensively on septic systems for household wastewater treatment and septic tanks are the main contributor of nitrates to groundwater. Nitrates are also a major concern at confined animal facilities, either through inadequate liners in storage ponds to contain wastes, or over-application of wastes on cropland, with the resultant leaching of nitrate and salts to groundwater (CVRWQCB 2005a).

Pesticides

Pesticides have been detected in wells throughout the Sacramento Valley. Counties with pesticide detections include Yuba, Placer, Butte, and Sutter and subbasins with pesticide detections include Colusa, Yuba, Butte, and American (CALFED 2000 and CVRWQCB 2005a). Detected pesticides are summarized in Table 3.7.

The pesticides bentazon and dibromochloropropane have been widely reported in groundwater in Sutter County. Bentazon has also been reported throughout the Feather River Basin in Butte, Yuba, Placer, and Sutter counties, and in isolated wells in the Yuba and American subbasins (CALFED 2000).

In addition to rice cultivation, pesticide use on other agricultural crops and the nonagricultural use of pesticides (e.g., golf courses, urban landscaping) contributes to the contamination of shallow groundwater (Dawson 2001).

Table 3.7. Summary of pesticides detected in wells in Sacramento Valley.

Pesticide	Use
Bentazon[1]	rice crops
Dichlorprop[1]	nonagricultural purposes
carbofuran	agricultural crops, rice crops
molinate	rice crops
thiobencarb	rice crops
atrazine	agricultural crops, nonagricultural purposes
diuron	agricultural crops, nonagricultural purposes
methyl azinphos	agricultural crops
simazine	agricultural crops, nonagricultural purposes
tebuthiuron	nonagricultural purposes
dibromochloropropane	agricultural crops, nonagricultural purposes

[1]The pesticides bentazon and dichlorprop are not currently used in the Sacramento Valley and have not been since the late 1980s (Dawson 2001).
Sources: CALFED 2000 and Dawson 2001.

3.6.3 Effects of Alternative A (No Action) on Groundwater

Alternative A would result in long-term, moderate adverse effects to groundwater quality. Under Alternative A, current agricultural practices would continue and groundwater quality would continue to decline. Improvements to groundwater would be dependent on existing programs.

Current agricultural practices introduce pesticides and nutrients into groundwater recharge resulting in the contamination of groundwater quality.

Selection of Alternative A would not contribute to the achievement of any of the CREP Objectives cited in Section 1.4.

3.6.4 Effects of Alternative B (CREP Agreement) on Groundwater

Implementation of Alternative B would result in moderate to high beneficial long-term effects to groundwater. Enrollment of land in FSA approved CPs would result in benefits to groundwater quality and quantity.

The retirement of 10,500 acres of land from active agricultural practices would result in less fertilizers and pesticides being applied in the proposed CREP project area. As a result, groundwater recharge from land enrolled in FSA approved CPs is expected to be of higher quality than recharge from previously cropped land.

Filtration of sediment, nutrients, pesticides, and pathogens provided by the CPs would help improve the quality of groundwater recharge.

Activities associated with the implementation of CPs could potentially result in short-term, adverse impacts to groundwater quality and quantity. These activities and their impacts are summarized below:

- Site preparation— CP establishment could require site preparation activities including building physical structures such as dikes and clearing enrolled land of undesirable plant species using chemicals such as herbicides and/or physical methods such as burning, discing, and plowing. These activities have the potential to add sediments and pesticides to surface water that recharges aquifers.
- Establishment of desirable plants and controlling invasive species or noxious weeds—Until desired plants are established, acres enrolled in CREP may be irrigated, potentially affecting water quantity.
- Maintenance of CPs—Maintaining CPs on enrolled CREP land may include additional soil disturbance to repair dikes or buffer strips, applying herbicides and/or pesticides to control invasive species, or irrigating land during critical growing periods of drought years.

A conservation plan for each CP would be prepared and BMPs will be used to mitigate any adverse impacts of implementing specific CPs. These impacts are expected to only last until the CP is permanently established and are considered minor compared to the overall long-term benefits of the CPs. These temporary impacts could be expected to last anywhere between 1-3 years.

The beneficial impacts of the NCV CREP project as discussed above would provide long-term moderate to high beneficial effects, assisting in the achievement of all four CREP Objectives (Section 1.4).

3.7 Drinking Water

3.7.1 Introduction

Drinking water quality is regulated by several State agencies. For instance, the DHS issues drinking water standards, or maximum contaminant levels, that stipulate the maximum concentrations of certain

chemicals in drinking water supplied to consumers. Basin plans designate beneficial uses, including municipal drinking water supply, for the Sacramento and San Joaquin rivers and Delta. Basin plans also specify numeric and narrative water quality objectives to protect designated beneficial uses (SWRCB 2005d).

The SDWA was originally passed in 1974 to regulate public drinking water supplies. The SDWA established standards for various contaminants to ensure that water is safe for human consumption. Additional amendments to the SDWA require States to develop programs to assess and protect public water sources. A summary of these programs is included in the following sections. Several SDWA terms are referred to throughout this section. These terms as defined by the EPA are:

- **Maximum Contaminant Level:** Under the Federal SDWA, EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as maximum contaminant levels (MCLs).
- **Public Water System:** A Public Water System is a system that provides water via piping or other constructed conveyances for human consumption to at least 15 service connections or serves an average of at least 25 people for at least 60 days each year.

Source Water Assessment Program/Wellhead Protection Program

The 1996 Federal SDWA amendments require each State to develop and implement a Source Water Assessment Program. Section 11672.60 of the California Health and Safety Code requires DHS to develop and implement a program to protect sources of drinking water, specifying that the program must include both a source water assessment program and a wellhead protection program. In response to both of these legal mandates, DHS developed the Drinking Water Source Assessment and Protection (DWSAP) Program (CDHA 2005).

California's DWSAP Program addresses both groundwater and surface water resources. The groundwater portion of the DWSAP Program serves as the State's wellhead protection program. In developing the surface water components of the DWSAP Program, DHS integrated the existing requirements for watershed sanitary surveys (CDHA 2005).

Since Congress passed the Wellhead Protection Program requirement in 1986, wellhead protection has been an active program on the national level. As of 1996, 44 States had wellhead protection programs approved by EPA. The remaining States (California, Alaska, Pennsylvania, Iowa, Florida, and Virginia) have some elements of wellhead protection or source water protection in place. The groundwater elements of this DWSAP Program constitute California’s Wellhead Protection Program (CDHA 2005).

3.7.2 Existing Conditions

The Sacramento/San Joaquin River Delta is the source of drinking water for two thirds of California’s population (over 20 million people). In addition, the Sacramento and San Joaquin rivers and many of their tributaries are sources of drinking water to many residents of the Central Valley and foothills (CVRWQCB 2005c).

Overall, in counties with a larger urban population (e.g., Sacramento) the majority of public drinking water is supplied by surface water, while in rural counties (e.g., Colusa) the majority of public water is supplied by groundwater. Table 3.8 summarizes drinking water use in each of the CREP counties.

Table 3.8. Drinking water supply summary for CREP counties.

CREP County	Public Supply				Domestic			
	Total population served (in thousands/ % of population	Withdrawals (mgal/day[1])			Total population served (in thousands)/ % of population	Withdrawals (Mgal/Day[1])		
		Ground water	Surface Water	Total		Ground water	Surface Water	Total
Butte	165/ 81	27.4	17.9	45.4	38/ 19	2.59	0.29	2.88
Colusa	12/ 62	3.2	0.0	3.2	7/ 38	0.48	0.05	0.53
Glenn	14/ 54	4.4	0.0	4.4	12/ 46	0.83	0.09	0.92
Placer	222/ 90	2.9	56.5	59.4	26/ 10	1.75	0.19	1.94
Sacramento	1,159/ 95	129.7	172.9	302.6	64/ 5	4.32	0.48	4.80
Solano	386/ 98	9.7	59.9	69.7	9/ 2	0.58	0.06	0.64
Sutter	58/ 73	6.0	9.7	15.8	21/ 27	1.44	0.16	1.60
Yolo	135/ 80	30.7	9.7	40.5	33/ 20	2.26	0.25	2.51
Yuba	39/ 65	10.6	0.5	11.1	21/ 35	1.41	0.16	1.57
CREP County Total	**2,191/ 90**	**225**	**327**	**552**	**232/ 10**	**16**	**2**	**17**
California Total	**30,100/ 89**	**2,800**	**3,320**	**6,120**	**3,810/ 11**	**257**	**29**	**286**

[1]Million gallons per day.
Source: USGS 2005b.

Drinking Water Quality

Since drinking water is supplied by both surface water and groundwater, water quality issues that affect these resources may affect drinking water supplies. Issues regarding surface water and groundwater quality are discussed in more detail in Sections 3.5 and 3.6. Specific issues related to surface water and groundwater are discussed in more detail below.

Surface Water

The Sacramento River and San Joaquin River watersheds and the Sacramento-San Joaquin Delta provide drinking water for over two thirds of the people in California. Most of Southern California, a major portion of the San Francisco Bay Area, parts of the Central Coast, and many Central Valley communities rely on these watersheds for their drinking water. The Sierra tributaries to the Sacramento and San Joaquin rivers are high quality sources of drinking water. As the water flows out of the foothills and into the valley, pollutants from a variety of urban, industrial, agricultural and natural sources affect the quality of the water (CVRWQCB 2005c).

The Sacramento and San Joaquin Rivers and their tributaries receive pollutants from municipal wastewater, industrial wastewater, urban storm water runoff, agricultural drainage, mine drainage, and fish hatcheries. Other sources of contaminants in the watersheds include the use of reclaimed wastewater for irrigation, dairies and feedlots, timber harvesting, and body contact recreation. These discharges contribute pathogens, organic carbon, dissolved solids, and numerous other contaminants to the rivers and Delta (CVRWQCB 2005c).

Groundwater

Currently, the best available and readily usable source of data for widespread groundwater quality assessment in California is the DHS public water supply well database. This database contains results of regular water quality monitoring, required by Federal and State laws and regulations, for numerous chemical, radiological, and bacteriological contaminants. The laws and regulations applicable to the public supply wells establish numerical water quality criteria for these contaminants, called MCLs, to protect public health. The DHS database contains water quality data and location data for over 15,000 public water supply wells within the State. While these data are not evenly distributed throughout the State or the aquifers within the State, they do provide a good inventory of the quality of groundwater that is being used for public consumption (SWRCB 2005c). Table 3.9 shows the total number of DHS-regulated public supply wells within each subbasin and the number of those wells that had a MCL exceedence for at least one of the contaminants in the contaminant group. These data show that, in general, the groundwater used for public supply is of reasonably good quality. When an occasional problem occurs, DHS's regulatory programs are in place to limit the public's potential exposure to contaminants (SWRCB 2005c).

Agricultural Impacts to Drinking Water

Nitrate contamination is pervasive throughout the State and is found in both surface and groundwater supplies and is the single biggest threat to California's drinking water. Currently about 10 percent of California public drinking water supply wells produce water that exceeds the regulatory drinking water limit; much more than 10 percent of the wells produce water approaching the limit. Nitrate contamination is of special concern in rural areas because nitrates are expensive to remove from drinking water supplies and many public and private systems rely on untreated groundwater and do not have the necessary water treatment infrastructure. Human activities that are sources of nitrate include animal operations, crop fertilization, wastewater treatment discharge, and septic systems (LLNL 2002).

Table 3.9. Groundwater quality in the Sacramento River hydrologic region.

Public Supply Wells Wells Exceeding MCL (Wells Sampled)							Groundwater Quality (TDS in mg/L[1])	
Sacramento Valley CREP Subbasins	Inorganics Primary	Inorganics Secondary	Radiological	Nitrates	Pesticides	VOCs	Avg	Range
Corning	0 (20)	0 (20)	0 (19)	0 (20)	0 (18)	0 (16)	286	130 - 490
Colusa	0(103)	18(103)	0 (57)	2 (109)	0 64)	0 (58)	391	120 - 1,220
Vina	0(52)	1(52)	0 (49)	4 (56)	0 (49)	4 (48)	285	48 - 543
West Butte	0(29)	2(29)	0 (25)	0 (30)	0 (26)	1 (26)	293	130 - 676
East Butte	1(30)	3(30)	0 (25)	2 (32)	0 (16)	0 (19)	235	122 - 570
North Yuba	0(27)	7(27)	1 (23)	1 (35)	0 (23)	2 (24)	ND	ND
South Yuba	2(38)	32(38)	0 (31)	0 (43)	0 (33)	1 (33)	ND	ND
Sutter	0(37)	12(37)	0 (34)	4 (41)	0 (19)	0 (20)	ND	ND
North American	7(265)	75(265)	2 (254)	0 (276)	0 (268)	6 (267)	300	150 - 1,000
South American	2(144)	46(144)	1(147)	1 (170)	0 (148)	8 (144)	221	24-581
Solano	1(71)	17(71)	0(41)	8 (96)	3 (56)	1 (57)	427	150 - 880
Yolo	3(61)	11(61)	0(53)	1 (67)	0 (59)	1 (59)	880	480 - 2,060
Capay Valley	ND	ND	ND	ND	ND	ND	ND	ND

[1]milligrams per liter.
Source: SWRCB 2005c.

In agricultural areas, possible co-contaminants with nitrate in groundwater include pesticides, herbicides, and their transformation products. California's Department of Pesticide Regulation has recently documented the contamination of California well water by several pesticides/herbicides. The frequencies of detection of simazine or atrazine transformation products were more than ten times greater than those of their potential parent compounds. In fact, degradation products of triazine herbicides have previously been reported to be more prevalent than their parent compounds in groundwater. Transformation products of pesticides/herbicides are seldom regulated and thus rarely subject to analysis in groundwater. However, they may be of concern if they are present in nitrate contaminated water that is being considered for restoration and re-use (LLNL 2002).

3.7.3 Effects of Alternative A (No Action) on Drinking Water

Declining drinking water quality would continue to be a long-term, minor adverse result of the No Action alternative. Current State and Federal laws prevent any major discharges that would significantly degrade a drinking water source. Still, the cumulative impacts of agricultural activities and other industrial activities in NCV CREP project area would have an ongoing adverse effect on drinking water.

Selection of Alternative A would not contribute to the achievement of any of the CREP Objectives cited in Section 1.4.

3.7.4 Effects of Alternative B (CREP Agreement) on Drinking Water

The implementation of Alternative B would result in long-term, minor to moderate beneficial effects on drinking water. Either indirectly or directly, each of the CPs improves surface water quality and potentially could improve the quality of water that recharges groundwater.

Since CREP CPs have had beneficial effect on surface water quality, it is likely that groundwater quality would also improve. Acres removed from active agricultural production would have the potential to result in less agricultural pollutants in groundwater and surface water.

For individual CREP contracts, FSA would ensure through a site specific environmental review that the practice(s) employed would not contaminate or contribute to the contamination of wellhead protection areas and to drinking water source areas to the extent that a hazard to public health is created.

The water purifying capabilities of the CPs would contribute to the achievement of all four CREP objectives listed in Section 1.4.

3.8 Wetlands

Section (a) (16) of the Food Security Act, Public Law 99-198, December 23, 1985 defines a wetland as:

> The term "wetland," except when such term is part of the term "converted wetland," means land that has a predominance of hydric soils and that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

Numerous laws exist that govern FSA program actions in relation to wetlands. Included are the following:

- EO 11990, Protection of Wetlands
- CWA
- Food Security Act

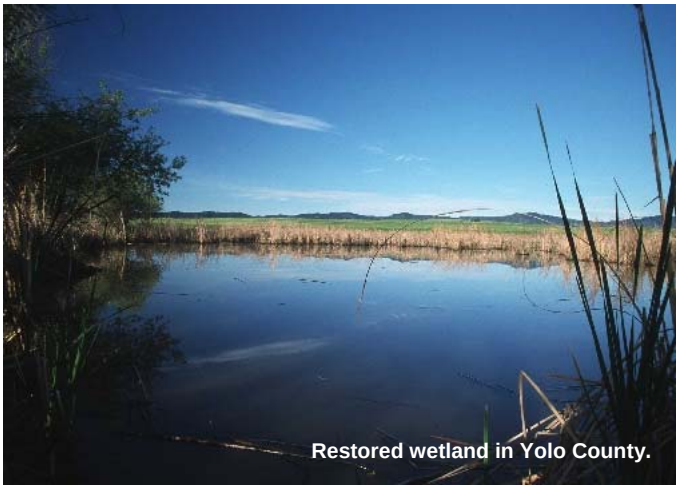
Recent policies and laws adopted by California's Governor and the legislature underscore the importance of protecting and restoring California's wetlands. The following discussion briefly outlines several of the most significant State wetland policies. In August 1993, the Governor announced the California Wetlands Conservation Policy. The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and Federal wetlands conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

The Governor also signed EO W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy (CERES 2005a).

3.8.1 Existing Conditions

California's Central Valley has suffered the most extensive loss of wetlands of any agricultural region in the nation. Historically, millions of acres of wetlands flourished in the Central Valley, but stream diversions, dams, and dikes have dried all but five percent (only 300,000 acres of the original four million acres remain) (Proposal 2000). Nonetheless, the Central Valley remains an important rest stop for migratory waterfowl; each year, millions of ducks, geese, and other birds winter at the many seasonal wetlands and wildlife refuges owned and managed by the Departments of Fish and Game and Parks and Recreation, and the FWS.


Restored wetland in Yolo County.

Many of the existing wetlands have been restored in the last decade through the Wetland Reserve Program, FWS Conservation Easement Program, the State's PWEP, or as a result of National Wildlife Refuge (NWR) and State Wildlife Management Area (WMA) acquisitions (Proposal 2000). About 59 percent of the remaining wetlands in the Central Valley are protected through either public ownership or perpetual conservation easements. State and Federal refuges total 37,406 and 54,645 acres respectively (DOI 1996). The 10 publicly managed fresh-water wetland areas in the counties of the project area are listed in Table 3.10.

Forty-one percent of the Central Valley's wetlands are in private ownership (DOI 1996). Many of the wetlands in private ownership are managed by waterfowl hunters to provide high-quality waterfowl and upland game hunting, bird watching, and other forms of wildlife recreation (Proposal 2000). The remaining privately owned wetlands have no protection established (DOI 1996).

Table 3.10. Publicly managed fresh-water wetlands in counties of the NCV CREP area.

National Wildlife Refuges	State Wildlife and Ecological Reserves
Sacramento	Upper Butte Basin
Delevan	Gray Lake
Butte Sink	Yolo Bypass
Colusa	Suisun Marsh
Sutter	
Stone Lakes	

Source: CERES 2005a.

Wetlands in the area are a valuable resource for resident and migrating wildlife, especially bird populations. Specifically in the project area, 97 species of wetland-dependent birds have been recorded; 35 of these breed in the region (Proposal 2000). The Central Valley wetlands:

- Provide wintering habitat for 19 percent of the wintering waterfowl in the continental United States;
- Support some of the highest densities of wintering waterfowl in the country and are the highest priority wetlands nationally for wintering habitat preservation;
- Support commercially and recreationally important Chinook salmon resources and a striped bass sport fishery; and
- Provide habitat for five federally-listed endangered species and three threatened species (DOI 1996).

In California, wetlands are commonly classified according to the length of time that an area is inundated or saturated by water. For example, areas that are inundated or saturated throughout the entire year are referred to as permanent wetlands (CERES 2005a). Likewise, if an area is only saturated or inundated for part of the year it is classified as seasonal or perennial wetlands. Seasonal wetlands are common throughout the Central Valley. Most (80-90 percent) of the wetland acreage of the State and Federal refuges is maintained as seasonal wetlands, and one of the most common types of seasonal wetlands in the Central Valley is vernal pools (DOI 1996).

Vernal Pools

Vernal pools are seasonally flooded depressions found on ancient soils with an impermeable layer such as a hardpan, claypan, or volcanic basalt. The impermeable layer allows the pools to retain water much longer then the surrounding uplands; nonetheless, the pools are shallow enough to dry up each season. The greatest extent of this landscape feature is in California's Central Valley, in areas where alluvial surfaces were exposed after the retreat of the inland sea during the Pleistocene era (CERES 2005a).

Vernal pools provide a unique ephemeral habitat for highly specialized and endemic plants and freshwater invertebrates, crustaceans, and amphibians. Vernal pools exist as "banks" of resting seeds, cysts, and eggs during the dry summers until winter rains allow the dormant stages to emerge and renew the cycle (CERES 2005a).

Vernal pools in the Central Valley provide critical resting and foraging habitat for migrating waterfowl along the Pacific flyway. Protein-rich invertebrates and crustaceans, as well as the roots and leaves of vernal pool plants, present an important seasonal food source for the waterfowl as well as other non-migratory bird species (CERES 2005a).

Many vernal pool plants are related to species with agricultural or medicinal properties. As such, vernal pools represent an important reservoir of genetic material that could provide natural pharmaceutical compounds and commercially important genetic materials in the future (CERES 2005a).

At one time vernal pools dotted the Central Valley, but hydrological alterations for development and agriculture has resulted in the loss of nearly 75 percent of vernal pool habitat. Twenty-four plant and animal species that rely on vernal pools are federally listed, proposed, or candidate species (FWS 2005a). In the Central Valley, federally listed species include the vernal pool fairy shrimp (*Branchinecta lynchi*), the vernal pool tadpole shrimp (*Lepidurus packardi*), Greene's tuctoria (*Tuctoria greenei*), hairy Orcutt grass (*Orcuttia pilosa*), and Hoover's spurge (*Chamaesyce hooveri*). To protect this unique and declining habitat, in 2003 the FWS designated 739,105 acres of vernal pool critical habitat including 35,036 acres in counties with in the project area (FWS 2005b).


Vernal Pool in the Central Valley. Photo Courtesy of CERES.

3.8.2 Effects of Alternative A (No Action) on Wetlands

With the selection of the No Action Alternative, wetland values (e.g., vegetation, water quality, and habitat) would continue their slow decline. Given ongoing Federal involvement, total wetland acres would likely be stable or slightly reduced under No Action because Section 404 of CWA and other Federal laws are very restrictive in allowing draining or conversion of existing wetlands for other uses.

Alternative A would result in long term, moderate adverse effects to State wetlands and would not achieve any of the CREP Objectives listed in Section 1.4.

3.8.3 Effects of Alternative B (CREP Agreement) on Wetlands

Implementing CP21 (filter strips), CP22 (riparian buffers), and CP9 (shallow water areas for wildlife) in the affected California counties would improve water quality upstream of wetland areas. The conversion of agricultural land to CPs may reduce levels of nutrients and pesticides applied to land, potentially improving the water quality in surrounding wetlands and decreasing negative impacts of agricultural chemicals on wetland plant and wildlife species.

Importantly, riparian areas and the creation of shallow water areas would return portions of the landscape of the Central Valley to a more natural state. A more natural setting would support large populations of migrating waterfowl as it did for centuries before agricultural production drastically altered the landscape. Native wetland plants and wildlife will benefit from both the return to a more natural system as well as from improved water quality.

The beneficial impacts of the NCV CREP project as discussed above would provide long-term moderate to high beneficial impacts to the area's wetlands, assisting in the achievement of all four CREP Objectives (Section 1.4).

3.9 Floodplains

3.9.1 Introduction

All Federal actions must meet the standards of EO 11988, Floodplain Management. The purpose of the EO is to avoid incompatible development in floodplain areas. It states, in part, that:

> Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

In accordance with the EO and prior to any action, Federal Emergency Management Agency (FEMA) floodplain maps will be reviewed to determine if the proposed action is located in or will affect a 100- or 500-year floodplain. The most widely distributed flood map product is the Flood Insurance Rate Map (FIRM). Flood risk information presented on FIRMs is based on historic, meteorologic, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development. To prepare FIRMs that illustrate the extent of flood hazard in a flood prone community, FEMA conducts engineering studies referred to as Flood Insurance Studies. Using information gathered in these studies, FEMA engineers and cartographers delineate Special Flood Hazard Areas on FIRMs. Special Flood Hazard Areas are those areas subject to inundation by a flood that has a 1-percent or greater chance of being equaled or exceeded during any given year. This type of flood is referred to as a base flood. A base flood has a 26-percent chance of occurring during a 30-year period. The base flood is a regulatory standard used by Federal agencies, and most States, to administer floodplain management programs, and is also used by the National Flood Insurance Program as the basis for insurance requirements nationwide (FEMA 2005b).


Flood managed wetlands. Photo Courtesy of DWR.

Soil survey maps, aerial photography, and topographical maps should be used where no FEMA maps are available. FSA should complete surveys in areas where no flood hazard or flood elevation data are available and the amount of Federal investment in the proposed action is significant if the action could create a significant adverse effect on a floodplain.

Most of the CPs allowed under CRP would have little to no effect on the functions and values of a floodplain. For example, CP1 – Establishment of Permanent Introduced Grasses and Legumes, would not have any measurable effect on floodplain flowage, capacity, or other functions. CPs involving construction activities, substantial earth movement, diking, or other means of altering the flowage area (i.e., CP9 – Shallow Water Areas for Wildlife) 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.

3.9.2 Existing Conditions

Floodplains are seen as valuable resources by our society. They provide opportunities for flood protection, agricultural production, open space, valuable native habitat, ecosystem protection, recreation,

economic development, and housing (CFMTF 2002). Today, land use in the floodplains of the Sacramento River is principally agricultural and other open space, with the largest urban floodplain development in the Sacramento, Stockton, Fresno and Yuba City/Marysville metropolitan areas (Reclamation Board and USACE 2002).

The CREP project area is located downstream of Chico Landing. From Chico Landing to the Delta, a system of levees, weirs, bypasses, and natural overbank areas control floods and convey flow to the Delta. The topography of the Central Valley and surrounding terrain creates flood intensities unseen elsewhere in the nation. Flooding of agricultural land, urban areas, and major transportation is frequent. Inundation of land occurs when levees break or flood protection system is inadequate for flows (Reclamation Board and USACE 2002). In some areas near the Sacramento River, the stream channel is higher in elevation than the surrounding land surface. This condition can result in water logging of lands adjacent to the river and consequent crop losses due to seepage from the stream channel. DWR has identified several areas where this problem occurs (CALFED 2000).

Regulatory floodplain mapping on a countrywide basis was started by the Federal government in the late 1960s. In the State, it is estimated that FEMA has now mapped approximately 15,000 miles of stream systems by both detailed and approximate study methods (DWR 2005a). All nine counties within the proposed CREP project area have floodplain mapping (FEMA 2005a). However, there are limitations to FEMA floodplain maps. The mapping technology and methods used to map and define base flood elevation are, at best, accurate to only plus or minus one foot. In addition, changes in the watershed can alter the level of flooding shown on the issued FIRMs (CFMTF 2002).

In addition to FEMA mapping the State of California has floodplain mapping program called Awareness Mapping. The intent of this program is to identify all pertinent flood hazard areas within the next ten years. Detailed studies of all potentially developable areas would be cost prohibitive to accomplish within the foreseeable future. This necessitates use of approximate assessments mapping 100-year "awareness floodplains" for both riverine and alluvial fan conditions. The final mapping product includes the base map and delineation of the approximate floodplain boundaries. As this mapping information becomes available, it will be provided to the community and will be available on the Internet for reference. The intent is to provide the community as well as the individual citizen an additional tool in understanding potential flood hazards currently not mapped as a regulated floodplain. This will enable each community to provide better protection for its citizens against loss of life and loss of property damages during a flood event as well as reduce community costs for emergency response needs (Reclamation Board and USACE 2002).

Flooding in a California Floodplain. Photo Courtesy of DWR (2005).

3.9.3 Effects of Alternative A (No Action) on Floodplains

Floodplain areas would not change and stream profiles (a major factor in the determination of floodplain areas) would not change based on Federal actions. Under the No Action Alternative, CREP funds would not be available to implement CPs that may have beneficial effects on floodplain conditions, especially the ability of floodplains to store floodwaters. Some construction may occur that would alter floodplain flowage, capacity, or other

functions. Without FSA oversight, poor design of structures could affect flowage areas, shifting the floodplain, and impacting areas outside the 100-year floodplain.

Alternative A would not contribute to the achievement any of the objectives listed in Section 1.4 and would result in little change to the State's floodplains.

3.9.4 Effects of Alternative B (CREP Agreement) on Floodplains

Minor improvements in floodplain areas and stream profiles would occur. CREP funds would be used to increase floodwater storage capacity through installation of riparian buffers, improve habitat through restorative plantings, and install structures within existing floodplains

Minor adverse effects might occur with the implementation of CREP CPs that would require earth-moving activities or the building of structures. These activities could potentially alter floodplain flowage, capacity, or other functions. Appropriate FSA oversight would help ensure the proper design and installation of structures, thus limiting adverse effects to flowage areas and minimizing indirect effects to areas outside the 100-year floodplain. Analysis of the impact on floodplains, per EO 11988, would require the structures to be able to withstand 100-year flood events and remain functioning. These practices would help control flood events and improve floodplain values. Table 3.11, summarizes the effects of each approved CP.

Alternatives would be carefully considered by the FSA at the time that site specific environmental reviews are developed for each CREP contract. The direct impacts of all CPs would be generally positive, result in no to minor, long term improvements to floodplains, and would contribute to achieving the CREP Objectives discussed in Section 1.4.

Table 3.11. Summary of effects of CPs on floodplain functions.

Conservation Practice	Effect on Floodplain Functions		Description of Effects
	Short Term[a]	Long Term[b]	
1, Permanent Introduced Grasses and Legumes	No effect to minor positive effect	No effect to minor positive effect	No structures or earthmoving activities authorized for this CP. Grasses and other plants may increase soil infiltration slowing down runoff.
2, Establishment of Permanent Native Grasses	No effect to minor positive effect	No effect to minor positive effect	No structures or earthmoving activities authorized for this CP. Native grasses may increase soil infiltration slowing down runoff.
4D, Permanent Wildlife Habitat Non-easement	No effect to minor positive effect	No effect to minor positive effect	No structures or earthmoving activities authorized for this CP. Established vegetation would have little to no effect on the hydrology of the floodplain.
9, Shallow Water Areas	No effect to minor adverse effect	No effect to minor adverse effect	Earthmoving activities are authorized to construct dams, levees, dugouts, or dikes. Structures such as pipes, chutes, and outlets may also be constructed. Construction of dams, levees, dikes, chutes, and other structures may alter the hydrology of the floodplain and could adversely affect floodplain functions.
10, Vegetative Cover, Grass, Already Established	No effect to minor positive effect	No effect to minor positive effect	No structures or earthmoving activities authorized for this CP. Grasses and other plants may increase soil infiltration slowing down runoff.
12, Wildlife Food Plots	No effect to minor positive effect	No effect to minor positive effect	No structures or earthmoving activities authorized for this CP. Established vegetation may increase soil infiltration slowing down runoff.
21, Filter Strips	No effect to minor adverse effect	No effect to minor positive effect	Earthmoving activities such as grading, leveling, filling may be used during site preparations and could temporarily alter floodplain hydrology and result in minor short term adverse effects to floodplain functions. However, these activities are designed to reduce concentrated flow and once established will disperse surface flow increasing infiltration. Beneficial long term effects may occur since buffers reduce scour erosion in floodplains and slow down runoff through increased infiltration and surface detention.
22, Riparian Buffer	No effect to minor adverse effect	No effect to minor positive effect	Earthmoving activities such as grading, leveling, filling may be used during site preparations and could temporarily alter floodplain hydrology and result in minor short term adverse effects to floodplain functions. However, these activities are designed to reduce concentrated flow and once established riparian buffers will disperse surface flow increasing infiltration. Beneficial long term effects may occur since buffers reduce scour erosion in floodplains and slow down runoff through increased infiltration and surface detention.

[a] Short term is defined as the implementation period of the CP. Usually one to two years.
[b] Long term is defined as the CREP contract period, which is between 10-15 years.

3.10 Biological Resources

3.10.1 Introduction

The ESA was enacted to protect T&E species and to provide a means to conserve critical habitat. All Federal agencies were mandated to protect species and preserve their habitats by ensuring that Federal actions do not jeopardize the continued existence of listed species.

ESA defines an endangered species as one that is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future. T&E designations may be applied to all species of plants and animals except pest insects. A species may be threatened at the State level, but that same designation does not automatically apply nationwide, as species numbers may be greater in other States.

Critical habitat is defined by ESA as areas that are essential to the conservation of listed species. Private, city, and State lands are generally not affected by critical habitat until the property owner needs a Federal permit or requests Federal funding. Because the California CREP is partially funded by Federal dollars, consultation with FWS will be required when T&E species or critical habitat are encountered for CREP contracts.


Waterfowl at Gray Lodge Wildlife Area
Photo Courtesy of CDFG.

Section 7 Consultation

Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species.

Under Section 7, consultation with FWS is initiated when any action the agency carries out, funds, or authorizes may affect a T&E species or critical habitat. This process usually begins as an informal consultation. In the early stages of project planning, a Federal agency approaches FWS and requests informal consultation. Discussions between the two agencies may include what types of listed species may occur in the proposed action area, and what effect the proposed action may have on those species. This process begins with the environmental review process completed jointly by FSA and NRCS for each contract.

If the Federal agency, after discussions with FWS, determines that the proposed action is not likely to affect any listed species in the project area, and if FWS concurs, the informal consultation is complete and the proposed project moves ahead. If it appears that the agency's action may affect a listed species, that agency may then prepare a biological assessment (BA) to assist in its determination of the project's effect on a species.

When a Federal agency determines, through a BA or other review, that its action is likely to adversely affect a listed species, the agency submits a request to FWS for formal consultation. During formal consultation, FWS and the agency share information about the proposed project and the species likely to be affected. Formal consultation may last up to 90 days, after which FWS will prepare a BO on whether

the proposed activity will jeopardize the continued existence of a listed species. FWS has 45 days after completion of formal consultation to write the opinion.

In making a determination on whether an action will result in jeopardy, FWS begins by looking at the current status of the species, or "baseline." Added to the baseline are the various effects – direct, indirect, interrelated, and interdependent – of the proposed Federal action. FWS also examines the cumulative effects of other non-Federal actions that may occur in the action area, including State, Tribal, local, or private activities that are reasonably certain to occur in the project area (FWS 2003).

As discussed earlier in Section 1.8.1 of this document, FSA initiated formal consultation with the FWS for the original CREP Agreement. As a result FWS issued a BO concerning implementation of the NCV CREP on January 2, 2002. This BO mentioned, but did not fully address, the California tiger salamander (which was a candidate species at that time). The California tiger salamander has since been elevated to threatened status across its entire range and critical habitat has been proposed in its historic range, including in several CREP counties. FSA initiated formal consultation with FWS as a result, since re-initiation of consultation on an existing BO due to a new species listing or critical habitat designation is treated as a new consultation. FWS requested that FSA provide FWS with the necessary project information to allow them to amend the existing BO to address the California tiger salamander and its habitat. FWS also asked that FSA informally consult with FWS on a case-by-case basis for each CREP contracts, until such time as an amended California CREP BO is finalized and formal consultation is completed. For each CREP contract, FSA will provide FWS with a description of the project, a site assessment that complies with FWS's site assessment guidance for the species, and a statement of the effect of the proposed project on the species and its habitat.

3.10.2 Existing Conditions

Vegetation

Oak woodlands, riparian forests, vernal pools, freshwater marshes, and grasslands are the major natural vegetation types in the NCV (CERES 2005c). However, agriculture and development in the region have resulted in the reduction or elimination of many natural habitats and species, especially those associated with native grasslands and wetlands. Low-lying areas in the region once were routinely flooded, replenishing nutrients and providing water to many portions of the region not situated along waterways. However, diking and construction of levees to protect agricultural lands and residential areas have changed this, and many former vegetation communities have been eliminated or greatly reduced. Many species have adapted to agricultural land uses, although agricultural lands often do not supply all life cycle requirements (CALFED 2000).

Despite the challenges, the Sacramento Valley contains a large diversity of both lowland and upland habitats and species. Remnant riparian communities occur along most of the Sacramento River and its tributaries, notably along the upper reaches of the Sacramento River. Wetlands occupy many areas along the region's waterways. Grasslands and wooded upland communities also exist in the area (CALFED 2000).

T&E and Protected Plant Species

Threats to native vegetation have resulted in many State or Federal protected species. Vegetation types associated with listed species include grasslands, including vernal pools; fresh-water emergent wetlands; marshes; lakes, rivers and other open water; and chaparral and montane hardwoods (CALFED 2000).

Table 3.12 provides a list of plant species that occur in the NCV CREP area that are listed on State and Federal protected species lists.

Table 3.12. Federal and State-listed plant species occurring in the nine counties of the NCV CREP project area.

Common Name	Scientific Name	State Listing[1]	Federal Listing[2]
Indian Valley brodiaea	*Brodiaea coronaria* ssp. *rosea*	SE	
Maritime ceanothus	*Ceanothus maritimus*	SR	
Hoover's spurge	*Chamaesyce hooveri*		FT
Suisun thistle	*Cirsium hydrophilum* var. *hydrophilum*		FE
Soft-bird's beak	*Cordylanthus mollis* ssp. *mollis*	SR	FE
Palmate-bracted bird's-beak	*Cordylanthus palmatus*	SE	FE
Tracy's eriastrum	*Eriastrum tracyi*	SR	
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	SE	
Contra Costa goldfields	*Lasthenia conjugens*		FE
Mason's lilaeopsis	*Lilaeopsis masonii*	SR	
Pitkin Marsh lily	*Lilium pardalinum* ssp. *pitkinense*	SE	FE
Butte County meadowfoam	*Limnanthes floccose* ssp. *californica*	SE	FE
Colusa grass	*Neostapfia colusana*	SE	FT
Hairy Orcutt grass	*Orcuttia pilosa*	SE	FE
Slender Orcutt grass	*Orcuttia tennuis*	SE	FT
Sacramento Orcutt grass	*Orcuttia viscida*	SE	FT
Hartweg's golden sunburst	*Pseudobahia bahiifolia*	SE	FE
Tahoe yellow cress	*Rorippa subumbellata*	SE	
Layne's ragwort	*Senecio layneae*	SR	FT
Red Mountain catchfly	*Sinlene campanulata* ssp. *campanulata*	SE	
Showy Indian clover	*Trifolium amoenum*		FE
Greene's tuctoria	*Tuctoria greenei*	SR	FE
Crampton's tuctoria	*Tuctoria mucronata*	SE	FE

Source: CDFG 2005a and UC Berkeley 2005.
[1] SE = State-listed endangered; SR = State-listed rare
[2] FT = Federally-listed threatened; FE = Federally-listed endangered

Wildlife


Waterfowl at Gray Lodge Wildlife Area. Photo Courtesy of DFG.

The conversion of natural habitats to agricultural and urban uses and drought conditions has resulted in a decline in waterfowl and shorebird populations. However, the area remains important to various bird species throughout the year (CALFED 2000). The Central Valley contains one of the two most important wintering waterfowl areas in North America, supporting 60 percent of all the ducks in the Pacific Flyway. In addition, the NCV is one of the most important inland shorebird migration areas in the nation and is currently being considered by the Western Hemisphere Shorebird Reserve Network as a shorebird area of international significance (Proposal 2000).

Regional grasslands, although typically small in size, provide relatively high wildlife values because intensive and extensive agriculture have greatly reduced the available natural upland habitats. The extent of use by wildlife depends on the type of vegetation present and the adjacent land uses. Vernal pools that occur in grasslands support a wide diversity of native plants and invertebrates (CALFED 2000).

Many other wildlife species are dependent upon habitats provided within the project boundary. Numerous raptor species including northern harriers, red-tailed hawks, red shouldered hawks, American kestrels, white-tailed kites, and several species of owls are commonly found throughout the project area, and are local nesting species. Other species occasionally observed in the project area include bald eagles, golden eagles, peregrine falcons, Cooper's hawk, sharp-shinned hawk, and several other species. White-faced ibis, American bitterns, great blue herons, great egrets, snowy egrets, and black-crowned night herons are commonly observed, and are also local nesters. Mammals such as black-tailed deer, California vole, muskrat, western jumping mouse, coyote, gray fox, ringtail, raccoon, and striped skink are dependent upon habitats provided within the project boundary (Proposal 2000).

T&E and Protected Wildlife

Protected wildlife species occurring in the CREP project area are listed in Tables 3.13 and 3.14. Many of these species have been listed by Federal and State wildlife agencies because of habitat loss associated with agricultural development and water projects (CALFED 2000).

The 2002 BO for the NCV CREP, found in Appendix C, identified 16 federally listed species that can be found in the project area. Table 3.14 lists these species and documents the species' current status as of this PEA's publication. The 2002 BO determined that two species, the giant garter snake and the valley elderberry longhorn beetle, may be affected by CP implementation. During the current formal consultation process with FWS, the California tiger salamander was identified as another species which may be affected by CREP implementation.

Table 3.13. State-listed wildlife species occurring in the nine counties of the NCV CREP area.

Name	Scientific Name	State Listing[1]
FISHES		
Chinook salmon-winter run	*Oncorhynchus tshawytscha*	SE
Chinook salmon-spring-run	*Oncorhynchus tshawytscha*	ST
Delta smelt	*Hypomesus transpacificus*	ST
Sacramento splittail	*Pogonichthys macrolepidotus*	SE
AMPHIBIANS and REPTILES		
Black toad	*Bufo exsul*	ST
Southern rubber boa	*Charina bottae umbratica*	SE
Alameda whipsnake	*Masticophis lateralis euryxanthus*	ST
BIRDS		
Swainson's hawk	*Buteo swainsoni*	ST
California black rail	*Laterallus jamaicensis coturniculus*	ST
Greater sandhill crane	*Grus Canadensis tabida*	ST
Marbled murrelet	*Brachyramphus marmoratus*	SE
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	SE, ST
Bank swallow	*Riparia riparia*	ST
Willow Flycatcher	*Empidonax traillii*	SE
MAMMALS		
Sierra Nevada red fox	*Vulpes vulpes necator*	ST
Wolverine	*Gulo gulo*	ST
California bighorn sheep	*Ovis Canadensis californiana*	SE, ST

Source: CDFG (2005), CaliforniaHerps (2005).
[1] SE = State-listed Endangered; ST = State-listed Threatened

Table 3.14. Federally-listed species identified in the Biological Opinion for the NCV CREP area.

Common Name	Scientific Name	Current Status[1]
Reptiles and Amphibians		
Giant garter snake	*Thamnophis gigas*	T
California tiger salamander	*Ambystoma californiense*	T [2]
Fish		
Sacramento splittail	*Pogonichthys macrolepidotus*	T
Delta smelt	*Hypomesus transpacificus*	T
Birds		
Bald eagle	*Haliaeetus leucocephalus*	T
Mountain plover	*Charadrius montanus*	PT
Invertebrates		
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T
Conservancy fairy shrimp	*Branchinecta conservatio*	E
Vernal pool tadpole shrimp	*Lepidurus packardi*	E
Vernal pool fairy shrimp	*Brachinecta lynchi*	T
Plants		
Greene's tuctoria	*Tuctoria greenei*	E
Hairy Orcutt grass	*Orcuttia pilosa*	E
Sacramento Orcutt grass	*Orcuttia viscida*	E
Colusa grass	*Neostapfia colusana*	T
Hoover's spurge	*Chamaeyce hooveri*	T
Slender Orcutt grass	*Orcuttia tenuis*	T

Source: FWS 2002.
[1] T=Threatened, E=Endangered, PT=Potential Threatened, C=Candidate.
[2] The California tiger salamander designation has been changed from Candidate to Threatened since the BO was written in 2002.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle naturally tends to have small population sizes and occurs in low densities. The beetle is dependent on its host plant, elderberry (*Sambucus* spp.), a common component of the remaining riparian forests and savannahs in the project area and tends to occur in areas with high elderberry plant densities. The extensive riparian loss has depleted and fragmented the beetle's habitat, breaking the naturally small populations into even smaller, isolated populations (FWS 2002).

The primary threats to survival of the beetle are:

- Loss and alteration of habitat by agricultural conversion;
- Inappropriate grazing;
- Levee construction, stream and river channelization, removal of riparian vegetation and rip-rapping of shoreline;
- Non-native animals such as the Argentine ant, which may eat the early phases of the beetle; and
- Recreational, industrial, and urban development.

Valley elderberry longhorn beetle. Photo Courtesy of CDFG.

Insecticide and herbicide use in agricultural areas and along road right-of-ways may be factors limiting the beetle's distribution. The age and quality of individual elderberry shrubs/trees and stands as a food plant for beetle may also be a factor in its limited distribution (FWS 2002).

Two areas in Sacramento County have been designated as critical habitat for the valley elderberry longhorn beetle. Both areas are along the American River in the Sacramento metropolitan area. Two other areas within the NCV CREP project area are considered essential habitat for the beetle (along the Putah Creek in Solano County and west of Nimbus Dam along the American River Parkway in Sacramento County) (FWS 2002).

Giant Garter Snake

Endemic to wetlands in the Sacramento and San Joaquin valleys, the snake inhabits marshes, sloughs, ponds, small lakes, low-gradient streams and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields, and adjacent uplands. Loss of habitat because of agricultural activities and flood control has extirpated the snake from much of its range in former wetlands (FWS 2002).

Components of essential habitat for the giant garter snake consist of:

- Wetlands with adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover;
- Emergent, herbaceous wetland vegetation, such as cattails and bulrushes for escape cover and foraging habitat during the active season;
- Upland habitat with grassy banks and openings in waterside vegetation for basking; and
- Higher elevation uplands for escape cover (vegetation and burrows) and underground refuges (crevices and small mammal burrows) (FWS 2002).

Giant Garter Snake. Photo Courtesy of FWS.

The primary threat to the giant garter snake is the loss of its wetland and other habitat. Other threats include:

- Degraded water quality,
- Urban development,
- Vehicle mortality and disturbance by recreating humans, and
- Non-native predators (FWS 2002).

Currently, only a small percentage of remaining wetlands provide habitat suitable for the giant garter snakes throughout its range and the Sacramento Valley is known to support relatively large, stable populations because of (1) its abundance of rice farms and (2) managed marsh areas in Federal NWRs and State WMAs (FWS 2002 and FWS 2005b).

Although, rice farming in the area provides valuable seasonal foraging and upland habitat for the giant garter snakes, agricultural activities such as waterway maintenance, weed abatement, rodent control, and discharge of contaminants into wetlands and waterways can degrade snake habitat and increase the risk of snake mortality. Because of market-driven crop choices, agricultural practices, and land use, the availability of habitat in the future is uncertain and unpredictable (FWS 2002).

The giant garter snake also uses managed marsh areas in NWRs and WMAs (FWS 2005b). Although large areas of suitable snake habitat exist on duck club and waterfowl management areas, water management of these areas typically does not provide the summer water needed by snakes. Recent studies have confirmed the presence of the snakes at the Colusa and Sacramento NWRs (FWS 2002).

California Tiger Salamander

In accordance with a district court order dated August 7, 2003, FWS was ordered to publish a proposed rule to designate critical habitat for the Santa Barbara County distinct population segment (DPS) of the California tiger salamander by January 15, 2004, and a final rule by November 15, 2004. FWS published the proposed rule on January 22, 2004 (69 FR 3064) (FWS 2004a).

On August 4, 2004, FWS made a new determination regarding the listing status of the California tiger salamander. This determination changed the status of the Santa Barbara population. FWS determined that the California tiger salamander is threatened rangewide and published this finding along with a Special Rule exempting existing routine ranching practices throughout the species' range (69 FR 47212). The rule included a detailed analysis of threats to the California tiger salamander, central population, and a reclassification of the Santa Barbara County and Sonoma County populations. As a result, FWS removed these populations as separately listed DPSs and listed the entire California tiger salamander species as threatened (FWS 2004a).

California Tiger Salamander. Photo Courtesy of USGS, © Gerald and Buff Corsi, California Academy of Sciences

California tiger salamanders tend to inhabit upland habitats. The upland component of their habitat typically consists of grassland savannah, but may consist of grasslands with scattered oak trees, and scrub and chaparral habitats. California tiger salamanders cannot dig their own burrows and rely on active

burrows of small mammals such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) for shelter during the dry summer and fall months (FWS 2000 and FWS 2004b).

Although California tiger salamanders spend most of their lives in upland habitats, their reproduction is tied to aquatic habitats. Historically, they breed primarily in natural vernal pools, but they have been able to breed successfully in human-made stock ponds created for ranching and agricultural purposes. Migrations to and from breeding ponds occur during the rainy season (November to May), with the greatest activity from December to February. Breeding migrations are strongly associated with rainfall events (FWS 2000 and FWS 2004b).

Female California tiger salamanders mate and lay their eggs singly or in small groups attached to vegetation near the edge of the breeding pond. In ponds with limited or no vegetation, they may be attached to objects (e.g., rocks, boards, etc.) on the bottom of the pond. After breeding, adults return to small mammal burrows, although they may continue to come out nightly for approximately the next two weeks to feed. Lifetime reproductive success for other tiger salamanders is typically low, with fewer than 30 metamorphic juveniles per breeding female, and rates are even lower for California tiger salamanders (with roughly 12 lifetime metamorphic offspring per breeding female) (FWS 2000 and FWS 2004b).

The primary cause of the decline of the California tiger salamanders is the loss, degradation, and fragmentation of habitat from human activities. FWS stated that it believes "that one of the primary threats to the Central California tiger salamander is habitat destruction, degradation, and fragmentation. Much of this threat is related to losses of habitat to urban development and conversion to intensive agriculture" (FWS 2000 and FWS 2004b).

3.10.3 Effects of Alternative A (No Action) on Biological Resources

Implementation of the No Action Alternative, would result in minor adverse effects to biological resources in the NCV. New habitat for listed and other species would not be created. New T&E listings would continue as newly jeopardized species are identified. These new listings and the declining habitat conditions of the currently listed species suggest that overall impacts on T&E species reflect a slow decline as human actions conflict with and adversely affect both species and their habitat. Under Alternative A, the following negative impacts would occur:

- Habitat values would continue to degrade,
- Population growth would continue to crowd natural ecosystems, and
- Pollution levels in agricultural runoff would remain high.

Conservation agreements currently in place would remain for a period of time, depending on whether individual producers chose to place land back into production. Legislation and conservation programs would continue to regulate any construction or land conversion projects in existing habitats, but no additional acres would be set aside to encourage establishment of T&E, special, and sensitive plant and animal species.

The continued loss of wildlife habitat potentially threatens the agricultural viability of the region through land-use restrictions imposed by current and future State and Federal listings threatened or endangered species (Proposal 2000).

Under the No Action alternative, long-term, minor adverse effects would continue. Wildlife, terrestrial habitat, and essential fish habitat values in California would not benefit from the leveraged effects of habitat restoration and watershed improvement CPs and may continue to decline.

Alternative A would not contribute to the achievement of any of the objectives listed in Section 1.4, particularly the three objectives associated with improving wildlife habitat.

3.10.4 Effects of Alternative B (CREP Agreement) on Biological Resources

Many of the CREP CPs could potentially affect federally listed species. Implementing Alternative B would result in strong, long-term beneficial effects to wildlife habitat values in the CREP enrolled acreage across the project area. NCV CREP will restore three primary components of the pre-settlement NCV landscape, thereby helping to restore the region's functional integrity and decreasing the chance for addition species listings (Proposal 2000). Alternative B would contribute to the CREP objectives listed in Section 1.4, particularly the three objectives associated with improving wildlife habitat.

Several of the CPs would directly benefit biological resources:

- CP4D (permanent wildlife habitat – non-easement) creates permanent habitat and movement corridors – both critical in an increasingly fragmented landscape.
- CP9 (shallow water areas for wildlife) would convert large areas to wetlands. The constant water depths of 6 to 18 inches would provide for long-term filtering to improve water quality, benefiting the giant garter snake and other listed species.
- CP22 (riparian buffer) would provide for removal of nutrients and sediment in areas created for wildlife and aquatic organisms. It would also enhance the potential for wildlife movement along the riparian corridor by buffering the connective habitat from adjacent land uses.
- Filtering provided by CP21 (filter strips) would contribute to cleaner water entering the watersheds and various waterbodies.
- CP1 (Permanent Introduced Grasses and Legumes), CP2 (Establishment of Permanent Native Grasses), and CP10 (Vegetative Cover, Grass, Already Established) would provide land for native and other plants desirable for wildlife species.
- CP2 (Establishment of Permanent Native Grasses) would provide economic incentive for land owners to plant and maintain native plants.

As part of the CREP enrollment process, a contract involving appropriate CPs would be developed for each individual site. Each contract would have a site specific environmental review completed by FSA to determine if any T&E species are present and would be potentially affected by the proposed action. If so, consultation with FWS would be initiated. In addition, any CREP activity that may result in the disturbance of non-cropped areas adjacent to a proposed project site would be coordinated with FWS.

The Section 7 formal consultation by the FWS determined that the giant garter snake, the valley elderberry longhorn beetle, and the tiger salamander could potentially be affected by CREP implantation. Specific effects are detailed below.

Valley Elderberry Longhorn Beetle

Because agricultural fields need to be in production at least two out of the last five years to be eligible for CREP, the elderberry host plant is not likely to be present on CREP-enrolled land. Construction activities are not likely to affect the beetle, although possible removal of a few elderberry shrubs might occur on the margins of sites and be subject to removal during initial discing and/or earthwork (FWS 2002).

Eligible CREP sites are not within designated critical habitat for this species (FWS 2002).

Conversion of agricultural lands into riparian buffer would benefit the beetle if elderberry plants of suitable size became established. Fragmentation of habitat would be reduced and recovery of the species would improve (FWS 2002).

The maintenance practice of occasional dicing and reseeding upland areas to promote grassland is likely to reduce the potential for establishment of elderberry shrubs. If elderberry shrubs did establish, but were

removed every three to five years by activities under the proposed maintenance practices, their value to the beetle would be greatly diminished (FWS 2002).

Giant Garter Snake

Temporary construction or maintenance disturbance of CREP-enrolled areas may negatively affect giant garter snake populations. Specifically:

- *Discing*: Because initial grassland establishment on former ricelands would begin soon after the fall harvest when the snakes begin their dormancy period. It is possible that some snakes could be killed by discing. However, because the fields would have been previously dewatered and harvested with heavy equipment, the increment of additional snake mortality resulting from discing is low. Subsequent maintenance discing would be conducted within the active period for the snake, minimizing the possibility of mortality.
- *Dewatering:* The temporary dewatering of wetlands may cause individuals to move into areas of unsuitable habitat where they will experience greater risk of predation or other sources of mortality.

However, the extent of these disturbances is likely to be much less than disturbances associated with agricultural production (FWS 2002).

Giant garter snake populations could experience long-term negative impacts resulting from CREP implementation. The conversion of rice fields and other agricultural ditches and canals that provide critical standing water throughout the species' active season (early-spring to mid-fall) could decrease available habitat for the snake. While the wetland component of CREP could replace some of this lost habitat, certain wetland management and placement strategies would have to be considered:

- Wetland management of CREP areas would have to provide sufficient water throughout the active season to ensure high quality snake habitat and/or
- Wetland areas would have to be located adjacent to existing rice fields or drainage channels (FWS 2002).

Because of the relatively small individual size, the wide distribution of enrolled areas, the small amount of riceland conversion (one percent of the total rice acreage in Central Valley) and adjacency to rice and other irrigated crops, the negative impact of CREP on giant garter snake is unlikely. FWS expects snakes to respond by opportunistically using available permanent waters, moving to nearby adjacent ditches in reasonable proximity to the sites. Additionally, upland CREP sites in close proximity to ricelands could provide higher quality basking and hibernating sites and high water refuges for the snakes (FWS 2002).

Recreational activities (including camping, fishing, hunting, and hiking) could be indirectly facilitated by CREP projects could potentially cause harassment to giant garter snakes by disturbing normal activity patterns (FWS 2002).

California Tiger Salamander

Initially, California tiger salamanders may not be present in agricultural fields as they are taken out of production and entered in CREP. As grassland is established on these areas, habitat for the California tiger salamander may be developed. The maintenance practice of occasional discing and reseeding upland areas to promote grassland may have some potential to adversely affect the California tiger salamander.

3.11 Cultural / Tribal Resources

3.11.1 Introduction

Cultural resources include prehistoric and historic archaeological sites, architectural structures and designs, and American Indian resources. Prehistoric archaeological resources include the physical remnants of human activity that predate written records. They include archaeological sites, structures, artifacts, and other evidence of prehistoric human activities.

Historic resources can include materials, properties, or locations that postdate written records. These resources can include archaeological sites, structures, artifacts, documents, and other evidence of human behavior. They can also include locations of events that were important in history or that are associated with the lives of historically significant persons. Resources must normally be greater than 50 years old to be considered as historic and eligible for the National Register of Historic Places. However, it is possible for a resource less than 50 years old to be eligible. Properties that are of exceptional importance to a community, State, Tribe, region, or the nation may be eligible.

American Indian resources may include prehistoric sites and artifacts, areas of occupation and events, historic and contemporary sacred areas, materials used to produce tools and other objects, hunting and gathering areas, and other resources that may be of importance to contemporary American Indians. Traditional Cultural Properties (TCPs) that may be impacted by proposed actions may be referred to but not specifically identified in compliance documents in order to avoid unintended impacts on sacred or significant sites. Tribal consultation should be pursued to determine environmental impacts, if any, to TCPs.

California's Office of Historic Preservation offers four different historic registration programs:

- California Historical Landmarks,
- California Points of Historical Interest,
- California Register of Historical Resources, and
- National Register of Historic Places.

Each registration program is unique in the benefits offered and procedures required. If a resource meets the criteria for registration, it may be nominated by any individual, group, or local government to any program at any time. Resources listed in the National Register, California Historical Landmarks are automatically listed in the California Register. Points of Historical Interest designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register (OHP 2005a).

3.11.2 Existing Conditions

California has witnessed the growth and development of one of the most diverse collection of peoples and cultures found anywhere in the world. More than any other State, California's history and historic fabric is a layering of cultures beginning with American Indians and followed by waves of immigrants from around the world attracted by the State's resources (OHP 2005b).

California's population expansion and economic growth create development pressures that threaten historic resources, cultural landscapes, and TCPs (OHP 2005b). Much of the area with NCV CREP boundaries is used for agricultural purposes, where the ground surface is regularly plowed, raked, or tilled (CALFED 2000).

As of October 2004, there are 1,041 California Historical Landmarks; 766 Points of Historical Interest: 2,138 National Register listings: and more than 25,000 resources listed in the California Register (OHP

2005a). Table 3.15 outlines the numbers of National Register and California Historic Landmarks within the counties of the NCV CREP project area.

The majority of historic site types recorded in the region consist of local structures, such as houses, schools, libraries, churches, post offices, hotels, railroad stations or related features, mine sites, and bridges. Additional types of historic sites that have been recorded in the area and that may be likely to occur in the upper watersheds include mining-related structures or features, railroad grades and associated features, dams and culverts, refuse deposits, farmsteads, labor camps, landings for the shipment of agricultural produce, canneries, pumping stations, siphons, canals, drains, unpaved roads, bridges, and ferry crossings (CALFED 2000).

TCPs exist in the project area. Some natural or geologic features are traditionally considered sensitive or sacred. Sutter Buttes is considered by the Konkow and Maidu to be the location where spirits of the dead left for the afterworld. Marysville Buttes is also of mythical importance to the Patwin and Wintu. American Indain burial and cremation sites have been discovered in the region, and more are likely to be found. These types of sites are of concern to native peoples (CALFED 2000).

The primary American Indian groups known to have occupied the area include the Achumawi, Atsugewi, Konkow, Maidu, Nisenan, Nornlaki, Yana, Wintu, Patwin, and the Plains and Bay Miwok. Many of these cultures were rapidly reduced by missionization, epidemics, and results of the Gold Rush (CALFED 2000). There are currently five rural American Indina settlements, called rancherias, within the counties in the project area (Giese 1996). These rancherias, their associated Tribes, and county where they are located are detailed in Table 3.16.

Table 3.15. Historical places within counties of the NCV CREP project area.

County	National Register of Historic Places	California Historic Landmarks
Butte	26	9
Colusa	7	4
Glenn	2	2
Placer	19	20
Sacramento	88	56
Solano	20	14
Yolo	24	2
Yuba	14	7
Total	**200**	**114**

Source: NRHP 2005 and OHP 2005a.

Table 3.16. Native American settlements in the counties of the NCV CREP project area.

County	Name	Tribe
Butte	Berry Creek Rancheria	Maidu
Colusa	Cortina Rancheria	Wintun
Colusa	Colusa Rancheria	Wintun
Glenn	Grindstone Rancheria	Nomlaki and Wintun
Yolo	Rumsey Rancheria	Wintun (Yocha Dehe)

Source: Giese 1996.

3.11.3 The Effects of Alternative A (No Action) on Cultural / Tribal Resources

Minor to moderate adverse impacts on cultural resources would continue to occur. These include disturbance and destruction of prehistoric and historic sites and structures, either through ongoing land conversion for development or agricultural use. Sites and structures, if discovered on private land, may often not be reported. in some instances, destruction of a site or structure may occur before a professional is able to assess its significance. On Federal land or for actions requiring a Federal permit, potential impacts on cultural resources must be considered before the Federal agency can implement, fund, or permit a proposed action.

Without implementation of CREP, areas that could have been enrolled in CREP will not likely be evaluated for cultural resources.

Alternative A would not contribute to the achievement any of the objectives listed in Section 1.4.

3.11.4 The Effects of Alternative B (CREP Agreement) on Cultural / Tribal Resources

There would be minimal to no adverse effects on cultural resources, with the implementation of CREP. In fact, CREP implementation would likely complement any cultural resource management and stewardship goals.

Adverse effects to cultural resources in the CREP project area may occur during the installation of CPs. Installation activities requiring excavation or other earth moving activities could potentially disturb buried sites or artifacts. Additional impacts may result from increased pedestrian activity in an area, which provides opportunities for artifact theft or vandalism of cultural resources.

FSA will assess potential impacts to cultural resources as the result of any CREP contract and take appropriate actions to ensure that any adverse impacts are properly mitigated. As part of this process, a cultural resource survey of the property may be required. The review must take into account that deeply buried sites may be present and that CREP CPs may affect them. In addition, Tribal consultation may be required if TCPs are indicated.

Alternative B would assist the State in its efforts to meet the CREP objectives outlined in Section 1.4.

3.12 Environmental Justice

3.12.1 Introduction

All Federal programs, including CREP, must comply with EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Federal agencies are required to incorporate environmental justice as part of the overall agency mission.

The EO details that environmental justice ensures that all people, regardless of race, color, national origin, or income, receive the following treatment:

- Are provided with fair treatment and meaningful involvement with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies;
- Have the opportunity to express comments or concerns before decisions are rendered on the Federal programs, policies, procedures, or activities affecting them; and
- Share in the benefits of, are not excluded from, and are not adversely or disproportionately affected by Federal programs, procedures, policies, or activities.

Application for participation in the NSV CREP will require the completion of a site specific environmental review by FSA which addresses environmental justice issues. If the proposed action is found to cause any adverse human health or environmental effects to minority or low-income communities, a discussion of the negative impacts must be attached to the Environmental Evaluation and mitigation measures developed.

3.12.2 Existing Conditions

State Minorities

California is a racially diverse State. In 2000, less that half the population (46.7 percent) reported being of white, non-Hispanic decent. Persons of Hispanic or Latino origin make up the second largest portion of the State's population at 32.4 percent. The Asian community comprises 10.9 percent of the State's population; the African-American population 6.7 percent. Other minority groups make up a small percentage of California's population and include Asian or Pacific Islanders, American Indians, and Alaskan Natives. Almost 17 percent reported a race other than those listed in the 2000 Census (USCB 2005b).

Despite constituting less than half the State's population, almost 85 percent of the farm operators in California are white, non-Hispanic. Table 3.17 summarizes California's farm operator racial characteristics.

Table 3.17. Farm operators by race.

All Operators By Race	Number of Farm Operators
White	112,321
Black or African American	388
American Indian/Alaska Native	1,560
Native Hawaiian/Pacific Islander	354
Asian	5,379
Spanish/Hispanic or Latino Origin	11,985
More than one race	899

Source: NASS 2002.

Migrant Farm Workers

The vast majority of U.S. farm workers have been Mexican immigrants and their children since the Bracero Program, in effect from 1942 to 1964, brought in more than 4 million laborers from Mexico. Earlier decades saw substantial numbers of Chinese, Japanese, Filipinos, Native Americans, and African Americans working on farms. By 1983, an estimated 90 percent of the seasonal farm laborers in California were Mexicans or Chicanos, while nationwide the figure was 60 percent. Most migrant farm workers are either American citizens or are working in the country legally. The Department of Labor estimates that about 25 percent of migrant farm workers are illegal immigrants (CALFED 2000).

It is hard to estimate the population of migrant and seasonal farm workers (MSFW) because of the mobile nature of this population. There are currently two different way of estimating the MSFW population. The 2000 Farmworker Enumeration Study estimates that the California population of MSFWs and their dependents was 1,302,797 (NCFH 2004). Less than eight percent to the State's total of MSFW lived and/or worked in the counties of the NSV CREP project areas (Larson 2000). See Table 3.18 for the MSFW and their dependents' population for individual counties within the NCV CREP boundaries.

Another estimate was collected by the 2002 Census of Agriculture. Farm operators were asked whether any hired or contract workers were migrant workers, defined as a farm worker whose employment required travel that prevented the migrant worker from returning to his/her permanent place of residence the same day. All counties in the proposed CREP project area had farms that reported employing migrant farm labor; the data is summarized in Table 3.19 (NASS 2002).

Table 3.18. MSFW population estimates for counties in the NSV CREP project area.

County	Adjusted MSFW Estimates	Migrant Farm Workers	Seasonal Farm Workers	Non-Farm Workers in Migrant Households	Non-Farm Workers in Seasonal Households	MSFW and Non-Farm Workers
Butte	5,562	2,621	3,040	963	3,450	10,075
Colusa	10,860	5,028	5,832	1,848	6,617	19,325
Glenn	2,921	1,352	1,568	249	1,780	5,197
Placer	625	290	336	106	381	1,113
Sacramento	6,115	2,831	3,284	1,040	3,726	10,882
Solano	5,089	2,356	2,733	866	3,101	9,055
Sutter	11,050	5,116	5,934	1,880	6,734	19,664
Yolo	11,532	5,339	6,139	1,962	7,027	20,521
Yuba	4,169	1,930	2,239	709	2,541	7,420
CREP County Totals	**57,923**	**26,863**	**31,105**	**9,623**	**35,357**	**103,252**
California State Totals	735,109	338,966	393,142	124,570	446,118	1,302,797

Note: Numbers have been rounded and, therefore, may not add to totals.
Source: Larson 2000.

Table 3.19. Summary of migrant farm worker employment in proposed CREP project area.

County	Number of Farms with Migrant Farm Labor On Farms With Hired Labor	Number of Farms with Migrant Farm Labor On Farms Reporting Only Contract Labor
Butte	122	31
Colusa	100	24
Glenn	131	47
Placer	27	—
Sacramento	75	1
Solano	117	1
Sutter	196	—
Yolo	149	17
Yuba	63	—

Source: NASS 2002.

3.12.3 The Effects of Alternative A (No Action) on Environmental Justice Issues

Under this alternative, there would be no CREP funds available for any producers (including minorities). No FSA actions are required or necessary under the No Action Alternative to address existing or ongoing issues with environmental justice. Any ongoing environmental justice compliance problems are likely to continue under the No Action alternative.

3.12.4 The Effects of Alternative B (CREP Agreement) on Environmental Justice Issues

The NCV CREP would involve several different land owners of 10,500 acres throughout the NCV. Disproportionate effects on minority or underrepresented groups are unlikely, because most CREP agreements are likely to be widely separated by intervening non-CREP land holdings. Additionally, CREP sign-up would be monitored annually and barriers to enrollment would be identified using a non-user survey.

3.13 Human Health, Social, and Economic Issues

3.13.1 Introduction

NEPA, and its implementing regulations and guidelines, require consideration of the Human Health, Social, and Economic impacts of Federal actions in preparation of environmental documents. Section 1508.8 of the CEQ's "Regulations for Implementing NEPA" states that:

> Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
>
> Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial.

This PEA will present regional and local information on the health, social, and economic conditions in California that are relevant to the implementation of CREP and the potential impacts of the proposed project on these conditions.

3.13.2 Existing Conditions

Agricultural Economy

California agriculture produces an abundance of products, including over 50 percent of the U.S. production of fruits, nuts, and vegetables. Statewide, agriculture and related activities account for about 1 in every 10 jobs. Many towns, cities, and counties in the State are supported by the revenues brought in by agriculture and its support industries, particularly in the Central Valley. Even while the State's agricultural sector is squeezed by ever-increasing population growth and water supply uncertainty, the agricultural economy has continued to grow (CALFED 2000).

The Central Valley, as a whole, is one of the most important agricultural regions in the world, producing over 250 different crops (Proposal 2000). Farming and farm-related industries in the entire Central Valley are estimated to directly and indirectly create about 3 in every 10 jobs and about 30 percent of personal income (CALFED 2000). However, the CREP project area is generally characterized by basin

clay soils and much lower crop production values than the more fertile San Joaquin Valley segment of the Central Valley. Only 25 percent of the Central Valley's agricultural production comes from the nine counties in the CREP project area (Proposal 2000).

Although agriculture is in the NCV is not as significant as other areas in the State, farmland accounts for over 54 percent of the total land in the nine counties within the NCV CREP (NASS 2002). In 2003, agricultural production value for the nine counties was over $2 billion (CASS 2004). The percent of individuals employed by agriculture in the NCV area ranged from 0.5 percent in the Sacramento metropolitan area to over 29 percent in Colusa County (EDD 2005). Table 3.20 provides information on the area's agricultural employment for 2002.

Table 3.20. County agricultural employment information for 2002.

Area	Percent Employed	Number Employed
Butte County	3.3	2,500
Colusa County	29.3	2,160
Glenn County	19.1	1,400
Sacramento MSA[1]	0.5	3,400
Solano and Napa counties	4.0	7,500
Sutter and Yuba counties	11.2	4,800
Yolo	4.9	4,500

[1]Sacramento Metropolitan Statistical Area (MSA) includes all of Placer, Sacramento, and El Dorado counties.
Source: EDD 2005.

The economic value of agriculture to the communities in the region is greater than the gross value of the farm products (farm gate value) or the number of direct farm-related jobs. The agricultural industry can affect the local and regional economies in two ways. First, to produce and harvest a crop requires a variety of inputs, such as seed, fertilizer and chemicals, water, equipment and fuel, and labor. Then, after harvest, farm produce is transported, stored, processed, packaged, and marketed. These tasks result in direct economic activity. The second effect is the distribution of the income resulting from the initial direct economic activity. This income supports local and regional economies as this farm and farm-related income is spent for food, housing, and other consumer items (CALFED 2000).

Farms and ranches in the region provide hundreds of thousands of jobs. Besides the men and women who work directly in agricultural jobs, many others work in jobs that support agriculture-moving crops to market, processing them for consumption, and providing the equipment and materials needed to support the nation's most diverse agricultural economy. In turn, the wages earned by these workers and the taxes paid on agricultural property provide revenues that support local governments throughout the project area (CALFED 2000).

Recreation and Tourism

Recreation is a multi-million dollar industry in the State. The ability to enjoy "the great outdoors" is a much cherished value to many people. Wildlife viewing, fishing, hunting, and water-based recreation such as swimming, motor boating, sailing, and windsurfing are popular throughout the State, and particularly in the NCV. Overall, recreation use at important reservoirs, rivers, and wildlife refuges has paralleled increased population growth in the region. Consequently, recreation-related spending associated with increased visitation has become an important contributor to the local and regional economy (CALFED 2000).

Much of the recreation in the area is water-oriented. Fishing and boating are the most popular activities, accounting for approximately 70 percent of total use in one portion of the region. Almost every type of recreation boating activity can be found in waterways, including houseboats, sailboats, fishing boats, personal watercraft, speedboats, canoes, rowboats, and inflatable boats. Water-based recreation activities include fishing from a boat, water-skiing, sailing, cruising, operating personal watercraft, canoeing, kayaking, houseboating, hunting from a boat, swimming from a boat, boat camping, swimming from shore, bank fishing, and windsurfing (CALFED 2000).

Marinas provide many services in addition to boat berthing and boat fuel, including ski boat and houseboat rentals; boat services, such as boat launching and marine supplies; camping and picnicking facilities; guest docks and fuel stations; and food and beverage services. Marinas are not equally distributed throughout the region; the most heavily used areas include Lower Andrus Island in Sacramento County which provides nearly 1,700 boat berths (CALFED 2000).

Not all recreation activities are associated with water. The more popular land-based recreation activities include hunting, camping, picnicking, walking for pleasure, bicycling, wildlife viewing, photographing wildlife, sightseeing (driving for pleasure), and attending special events (CALFED 2000).

Wildlife-Specific Recreation

More so than any agricultural region in the nation, wildlife-oriented recreation is highly valued in California. Perhaps due to the State's rapidly increasing human population of over 33 million people, hunting opportunities in the Central Valley are highly coveted and play a significant role in agricultural economics. NCV farmers with adequate habitat commonly derive $30-50/acre annually from hunting leases (Proposal 2000).

While precise revenue numbers are not available for the NCV of California, revenue from hunting, fishing, and wildlife-associated act activities is considerable. A 2001 survey revealed that State residents and nonresidents spent $5.7 billion on wildlife recreation in California. Of that total, trip-related expenditures were nearly $2.2 billion and equipment purchases totaled $3.0 billion. The remaining $587 million was spent on licenses, contributions, land ownership and leasing, and other items and services (USCB and FWS 2003).

The NCV contains NWRs and WMAs. Wildlife refuges in the region provide fishing, hunting, and wildlife viewing opportunities. These refuges include Sacramento, Colusa, Sutter, and Delevan NWRs and Gray Lodge WMA (CALFED 2000). Each year, over 1.4 million people visit these wildlife areas to observe migratory birds, spending approximately $1.1 billion. The majority of these migratory birds use wetlands, uplands, and riparian areas (Proposal 2000).

Farm Worker Health

Migrant farm-working jobs are physically and emotionally demanding with hazardous working conditions from exposure to chemicals to risks for injury from accidents. Skin, eye, and respiratory problems are common occurrences. Additional occupational health hazards of farm work include tuberculosis, diabetes, cancer, and Human Immunodeficiency Virus (HIV) (NCFH 2005). All these conditions that require frequent medical treatment are difficult to treat due to the mobility of the population. Yet many migrant workers are fearful of the farmer causing them to lose their jobs, and therefore do not ask for the needed medical attention (Kossek et al. 2005).

EPA estimates that 300,000 farm workers in the U.S. suffer acute pesticide poisoning each year. Many of these workers do not seek treatment, or are misdiagnosed because symptoms can mimic a viral infection (NCFH 2005). Pesticide exposure can occur from a number of sources such as contaminated soil, dust, work clothing, water, and food, or through pesticide drift--the deposition of a pesticide off its target. Because of the nature of agriculture and the proximity of homes to the fields, family members could be

exposed to hazardous chemicals through pesticide drift. Agricultural workers can inadvertently expose family members to hazardous materials by carrying materials home from work on their clothes, skin, hair, and tools, and in their vehicles (McCauley et al. 2000).

Many migrants' lack of education and economic desperation can also contribute to health concerns. For example, a Washington State study of 460 hired farm workers found that 89 percent did not know the name of a single pesticide to which they had been exposed, and 76 percent had not received any information on appropriate protective measures (NCFH 2005).

In addition to physical health issues, migrant farm working families have psychological and social concerns. The challenges present in their daily lives pose serious structural constraints to cultural assimilation and the family's ability to manage stress and improve long-term overall social and economic well-being (Kossek et al. 2005).


Farm workers sorting tomatoes.
Photo Courtesy of CERES.

In addition to the Federal Migrant Health Program, California has two State-financed health care programs that specifically address the needs of farm workers and their dependents: the Seasonal Agricultural Migratory Worker Program and Rural Demonstration Projects. These programs target all of California's farm workers, including those employed year-around (Larson 2000)

Poverty

Despite the health concerns, the biggest challenge facing MSFWs is extreme poverty, with household incomes often far below U.S. Federal poverty guidelines. National data shows that one half of all farm working families earn less than $10,000 per year. This income is well below the 2002 U.S. poverty guidelines for a family of four of $18,100 (Kossek et al. 2005).

For the State of California, the poverty rate in 2002 was 13.3 percent, 1.2 percent higher than the national average. Within the counties in the project area, the average poverty rate was 12.6 percent. Butte, Glenn, and Yuba counties had poverty rates over 15 percent (ERS 2005). Table 3.21 outlines the poverty rate and the total number of individuals below the poverty line in 2002.

Pay Rates

Pay rates vary depending on whether the worker is paid an hourly wage or piece rate. Federal laws require that workers earn a minimum wage of $5.15 per hour. For the reference week beginning July 11, 2004, hired farm workers in California were paid an average $9.50 per hour. On average hired farm laborers worked 45.9 hours/week during the reference week of July 11, 2004 (NASS 2004). In the State of California in 2001, the average annual earnings of agricultural workers, including farm and non-farm jobs, was $9,289. The average earnings per employee were higher in agriculture than in non-farm jobs, $10,241 versus $7,592 (Khan et al. 2003).

Table 3.21. Poverty information for counties in the NCV CREP project area in 2002.

County	Poverty Rate est. rate (percent)	Number in Poverty est. rate (number)
Butte County	16.4	33,849
Colusa County	13.2	2,567
Glenn County	15.4	4,156
Placer County	5.5	16,123
Sacramento County	12.7	166,431
Solano County	7.9	31,329
Sutter County	13.0	10,848
Yolo County	11.3	19,967
Yuba County	17.8	11,075
Average of Area	**12.6**	**—**
Total in Area	**—**	**296,345**
California State	**13.3**	**4,646,661**

Source: ERS 2005.

3.13.3 The Effects of Alternative A (No Action) on Human Health, Social, and Economic Issues

Implementation of Alternative A would result in long-term minor to moderate adverse effects Human Health, Social, and Economic issues. Under Alternative A, agricultural practices would continue as they have for years. The degradation of water quality that currently results from agricultural practices would continue to impact the outdoor recreation industry. Alternative A would not result in any State water quality improvements, unless existing programs (see Section 1.6.3) are greatly expanded.

Implementation of Alternative A would likely have the following effects:

- The total amount of agricultural production in California would continue to respond to market forces and the economy of the State.
- The rental rates and land values of California acreage would continue to be affected by development values and population density.
- The total number of California farms would continue to respond to market forces and the economy of the State.
- Agriculture would continue to contribute roughly the same value to the overall economy.
- Any trends or cycles evident in the labor market would continue and provide the same number of jobs, with fluctuations due to market conditions.
- Alternative A would not offer mechanisms to improve the water quality of California. Because of the significant income provided by tourism, recreation, fishing, boating, and other water-related businesses, this continued degradation has the potential to negatively impact existing and future growth in the recreation and tourism sector.
- Without CREP, an initial economic incentive to alter current land use practices to enhance wildlife habitat on marginal cropland would be not be implemented. Waterfowl and pheasant

hunting opportunities on private lands would not be established on much of the private land; preventing the direct farm income generated from hunting leases. Also relinquished would be the indirect economic benefits to local communities through expenditures from dining, lodging, fuel, and supplies by visiting hunters.

- Alternative A offers no additional land preservation than the current programs offer. This may result in continued land use changes in the State (i.e., agricultural land conversion) and the socioeconomic impacts associated with these changes would continue.
- Exposure to pesticides and other harmful chemicals by farm workers and their families will continue to occur at current levels.
- Without the upland vegetation set aside fields on rice farms, the opportunity to use these lands to filter agricultural tailwater would not be realized. The current 30-day holding period for many herbicides in the rice culture often requires rice producers to retain treated water on rice fields, potentially decreasing production yields.
- Without CREP, the economic resources would not be available to rice producers for developing small, water-warming wetlands on their land. There would be no increased production resulting from warmed irrigation applied to rice fields.

The No Action Alternative would not meet any of the CREP objectives outlined in Section 1.4.

3.13.4 The Effects of Alternative B (CREP Agreement) on Human Health, Social, and Economic Issues

Implementation of Alternative B would result in long-term minor beneficial effects to the State's economy, though ultimately beneficial, long-term statewide economic effects from CREP implementation would be minimal. Enrollment of 10,500 acres of marginal cropland (about one-tenth of one percent of the State's total cropland) in NCV CREP would not have a detrimental impact on California's position as the nation's leading producer of agricultural products. Implementation of Alternative B would result in general improvement to the water quality of California. The degradation of water quality that currently results from agricultural practices, leading to ancillary impact to wetlands, wildlife, and tourism, would decline as a result of implementing CREP.

Implementation of Alternative B would likely have the following effects:

- If CREP was intensively implemented in a small geographic region, it could create a localized and artificial shift in rental rates and land values. CREP contains safeguards to prevent this from happening. For instance, there is a 25 percent acreage cap on CREP enrollments within a county, limiting the amount of cropland enrolled in CREP in a certain geographical region. In addition, the acres enrolled in CREP would likely be spread across the proposed project area, since participating landowners typically enroll partial farms or fields.
- CREP could also create a situation where land enrolled has a greater value than surrounding lands. This is unlikely to happen in California as income earned through CREP would remain less than the average development value of nearby land. CREP-enrolled lands are also lands that are marginally productive agricultural lands that are non-developable so there is no opportunity cost to enrollees. All of these factors would limit the acres of cropland taken out of production in a given area and, consequently, the local economic impact due to implementation of CREP would be minimal to non-existent. These rental rates and land values of California acreage would continue to be affected by development values and population density and would not be impacted by the Alternative B.
- CREP implementation could result in changes to total number of California ranches/farms. The 25 percent acreage cap on CREP and the practice of participating landowners to enroll partial farms or fields means that entire ranches and farms would not be enrolled in CREP. This total

would continue to respond to market forces and the economy of the State and not be impacted by Alternative B.

- CREP implementation would not substantially impact the State's economy. Agriculture would continue to contribute roughly the same value to the overall economy. CREP enrolled lands would provide residual income to enrollees, supporting the overall local economy although possibly at a slightly reduced rate. However, this slight reduction, spread across the proposed project area, would have an inconsequential effect on the total economy. California's economy would continue to be affected by market forces and would not be impacted by Alternative B.
- Alternative B would provide economic resources to rice producers for the development of small wetlands on their private land. These wetlands could be used as "rice checks," or small ponds that hold water for a short time to warm the water before applying it to their fields. Rice yields could increase for some rice producers by using this warmed water for irrigation.
- Any trends or cycles evident in the labor market would continue and provide the same number of jobs, with fluctuations due to market conditions. CREP enrollments would be spread across the western and southwestern part of the State and have only little to no effects to agricultural labor markets.
- Implementation of Alternative B has the potential to slightly reduce total agricultural acreage across the State because the CREP-enrolled land is removed from production. However, even at full enrollment, CREP would only affect one half of one percent of the State's harvested cropland. Additionally, the lands (partial fields, strips, or buffers) enrolled in CREP would most likely be less productive areas of a given farm. By enrolling these areas, the landowner may be able to reduce the overall input costs of farming operations, and in some cases, actually maintain or increase production by being able to concentrate resources on the remaining farmland. These two factors would likely result in minimal to no effects across the State. There would likely be no displacement of migrant farm workers. Agricultural production would continue to respond to market forces and the economy of the State and not be significantly impacted by Alternative B.
- There is a possibility for a slight beneficial effect to farm incomes from the steady and guaranteed receipt of CREP funds by enrolled producers. As discussed above, producers are more likely to enroll marginally productive lands and the residual income from CREP may result in slightly more or at least consistent income than the acreage was capable of producing as farmland. These values, if they occur, would not have a significant impact across the State.
- With the addition of native grasses, wildlife habitat would be improved and expanded. This has the potential to increase opportunities for hunting and fishing on the agricultural lands, bolstering and diversifying farm income directly through the generation of revenue from hunting leases. Indirect economic benefits to local communities through expenditures from dining, lodging, fuel, and supplies by visiting hunters could also be realized. Recreational resources would benefit from increased open space, enhanced or restored wetland or wildlife habitat, improved water quality, more protection against flooding, and increased fish and waterfowl population.
- Fair compensation for the retirement of marginal cropland would afford landowners the opportunity to focus farming efforts on more productive land, while reaping the recreational benefits of increased wildlife populations on marginally profitable land.
- Local resource-based recreation industries (e.g., boating, hunting) may also be affected by implementation of CPs, which are designed to decrease water use in the project area. Water CPs could potentially increase reservoir water levels within the project area. Increased reservoir levels, especially after drought recovery, could potentially restore recreational opportunities to normal conditions. Recovery of economic losses and a small boost in recreation-based revenue may occur.
- Alternative B offers an additional land preservation program to the State's producers, the benefits of which can be added to those provided by the current programs. This may slow the future rate

of large scale land use changes in the State (i.e., agricultural land conversion) and the socioeconomic impacts associated with these changes. Another potential effect is the financial incentive for producers to maintain open space, which may help enhance the value and desirability of surrounding residential and commercial land.

- Because of the decrease of harmful chemicals applied to CREP-enrolled land, human exposure to these chemicals will likely decrease. Therefore, the health of farm workers (including MSFWs) and their families could marginally improve.
- The establishment of set-aside upland habitat in the rice-growing region would increase rice herbicide management flexibility by allowing growers to filter agricultural tailwater. The current requirement of a 30-day holding period for many herbicides in the rice culture obligates rice producers to retain treated water on rice fields, often resulting in crop losses under certain environmental conditions. The upland set-aside fields developed through CREP would serve as a "release valve" for the treated water. Upland vegetation found on set-aside rice fields effectively binds up the chemicals, thereby improving water quality when treated water is finally returned to the stream of drainage channel.

Alternative B would assist the State in its efforts to meet the CREP objectives outlined in Section 1.4.

3.14 Air Quality

The Clean Air Act (CAA) requires EPA to establish and maintain standards for common air pollutants. To establish standards, EPA selected certain common air pollutants that typically are associated with human activities in communities. These pollutants include carbon monoxide (CO), ozone (O_3), oxides of nitrogen (NO_x), particulate matter smaller than 10 microns in diameter (PM_{10}), and oxides of sulfur (SO_x) (CALFED 2000). Other pollutants measured include particulate matter smaller than 2.5 microns in diameter ($PM_{2.5}$), ammonia (NH_3), and reactive organic gases (ROG).

EPA established standards for each of these criteria pollutants to manage air quality across the country. The new standards will not become effective until the current O_3 standard is met. Most States also have adopted standards for these pollutants. In some cases, the State standards are more stringent than EPA standards, to more precisely reflect local air quality conditions and planning objectives. For many States, including California, air quality management includes dividing the State into distinct areas, or "air basins," based on meteorological and geographic conditions and, where possible, jurisdictional boundaries. In California, 15 air basins have been delineated for air quality management. The regulation of air quality within each air basin in California is carried out by individual air quality management agencies or pollution control districts (CALFED 2000). The NCV CREP project area is within the Sacramento Valley Air Basin.

EPA concluded that monitoring the level of criteria pollutants can help determine and manage the relative air quality in a particular area. If the levels of any of the criteria pollutants in a particular geographic area exceed the State or Federal standards established for those pollutants, the area is designated as "nonattainment" for those pollutants. Likewise, if standards for pollutants are met in a particular area, the area is designated as "attainment" for those pollutants. In areas where standards may not have been established for certain criteria pollutants, the areas are considered "unclassified" for the pollutants. The CAA also requires that nonattainment areas for criteria pollutants prepare and implement State Implementation Plans to achieve the standards (CALFED 2000).

3.14.1 Existing Conditions

In summer months, the Pacific high-pressure system can create inversion layers in the lower elevations that prevent the vertical dispersion of air in the Sacramento Valley Air Basin. As a result, air pollutants in this portion of the region can become concentrated during summer, lowering air quality. During winter, when the Pacific high-pressure system moves south, stormy, rainy weather intermittently dominates the

region. Prevailing winter winds from the southeast disperse pollutants, often resulting in clear, sunny weather and better air quality over most of this portion of the region (CALFED 2000).

The Sacramento Valley Air Basin is currently a federally and State-designated attainment area for NO_x. The urbanized area in Sacramento County is a federally designated nonattainment area for PM_{10}, but the remainder of the Sacramento Valley Air Basin attains the Federal PM_{10} standard. The entire basin is in nonattainment (Federal and State standards) for CO and 0_3 (CALFED 2000).

3.14.2 Impacts of Agriculture on Air Quality

Major causes of California's air pollution derive from its drastically growing population, especially the increase of vehicle miles traveled each day (CARB 2005). However, agriculture contributes to the overall air quality problems of the State. Table 3.22 summarizes the sources of agricultural emissions in the State.

Table 3.22. Statewide emission inventory of pollutants by source.

Source	Emissions (tons/day, annual average)						
	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Food and Agricultural Processing	5	55	35	3	3	3	-
Food and Agriculture Industrial Processes	20	3	9	1	15	7	-
Pesticides/Fertilizers - Farm Use	53	0	0	0	0	0	-
Farming Operations							
Tilling, Harvesting, & Growing	0	0	0	0	145	32	-
Livestock	118	0	0	0	19	2	252
Fugitive Windblown Dust							
Farm Lands	0	0	0	0	180	40	-
Pasture Lands	0	0	0	0	19	4	-
Agricultural Burning	19	216	6	0	26	24	1
Farm Equipment							
Non-Evaporative	2	67	2	0	0	0	0
Evaporative	1	0	0	0	0	0	0
Diesel	15	57	125	1	8	8	0
Agricultural Sources Total	**56**	**464**	**259**	**2**	**241**	**84**	**1**
Total Statewide- All Sources	**2,512**	**13,802**	**3,126**	**213**	**2,086**	**765**	**493**
Percentage of State Emission Sources Associated with Agriculture	**2%**	**3%**	**8%**	**1%**	**12%**	**11%**	**0%**

Source: CARB 2005.

Rice Straw Burning

Over 500,000 acres of rice are grown each year in the Sacramento Valley (CARB 2003). The post-harvest management of rice stubble represents the chief agriculture-related air quality concern within the project area. Rice culture has traditionally involved the post-harvest burning of rice straw to recycle nutrients and control various rice diseases. While burning is generally regarded as the simplest, most effective, and most economical straw removal method, post-harvest burning results in emissions of smoke and other pollutants that contain inhalable particulate matter (Proposal 2000).

Burning during the fall is most effective for disease control. Therefore, growers try to burn as much as possible during the fall. Unfortunately, relative to the spring, the fall can be a poor time to burn because of poor air quality due to stagnant meteorological conditions (CARB 2003). Fall meteorological conditions frequently result in smoke lingering for days. Smoke exposure has been associated with adverse health effects particularly among those with respiratory and cardiovascular illness (CARB 2003).

Rice straw burning in the Sacramento Valley. Source: UC Davis.

In order to reduce the public health impacts of rice straw burning, the State enacted the Rice Straw Burning Reduction Act in 1991 to phase-down the burning of rice straw in the Sacramento Valley. This phase-down occurred over a period of nearly ten years, with progressively fewer acres of rice fields eligible to be burned each year. Starting in 2001, the Act sets the limit on the rice acreage which can be burned at 25 percent of an individual grower's planted acreage, not to exceed 125,000 acres basinwide. In addition to these basinwide acreage caps, individual fields can only be burned for disease control. The phase-down has proceeded as specified in the Act, with growers achieving greater acreage reductions than mandated basinwide. The total rice acreage burned annually has declined from 303,000 acres in 1992, the first year of the phase-down, to slightly fewer than 72,000 acres in 2002 (Table 3.22) (CARB 2003).

The frequency of complaints from the public about smoke from agricultural burning is sometimes used as an indicator of the extent to which the public is subjected to impacts of smoke. While complaints may not be a true representation of smoke impacts, they can provide useful information about the smoke management program. The ARB and the air pollution control districts track the number of smoke complaints received from the public during the fall intensive burn period; Table 3.23 includes these complaints (CARB 2003).

Table 3.23. Sacramento Valley rice straw burning phase-down and smoke related complaints.

Burn Year (Sept 1- Aug 31)	Rice Acres Planted	Rice Acres Burned	Percent Acres Burned	Smoke Related Complaints[1]
1992	401,807	303,103	75%	59
1993	450,253	305,636	68%	101
1994	514,045	293,210	57%	335
1995	500,705	268,216	54%	133
1996	514,720	211,322	41%	141
1997	517,233	133,640	26%	80
1998	490,625	140,627	29%	42
1999	535,949	137,930	26%	15
2000	521,000	143,030	27%	38
2001	501,648	76,797	15%	22
2002	542,225	71,890	13%	13

[1] Included for the fall burn season only.
Source: CARB 2003.

3.14.3 The Effects of Alternative A (No Action) on Air Quality

If the CREP program is not implemented, agricultural practices will, at the very least, continue unchanged. Rice and other agricultural products would continue to be harvested on marginal land and burning of rice straw and other crops would continue, potentially degrading the air quality in the area. Land currently in crop production will also continue to be plowed, contributing to the State's dust problem. Fertilizers and pesticides would continue to be used on cropland, continuing, if not increasing, the ROG emitted into the air.

3.14.4 The Effects of Alternative B (CREP Agreement) on Air Quality

With the proposed CPs for the NCV CREP, marginal cropland will be planted in native grasses and other cover crops, creating vegetative groundcover. Enrollment of marginal ricelands into CREP will slightly reduce the total rice grown in the project area, potentially reducing emissions associated with post-harvest burning. Retirement of existing agricultural lands could result in long-term beneficial air quality impacts associated with decreases in emissions from preparing agricultural land, burning fossil fuels, and applying herbicides and pesticides.

Alternative B would assist the State in their efforts to meet the CREP objectives outlined in Section 1.4.

3.15 Cumulative Effects

3.15.1 Introduction

CEQ regulations require that the cumulative effects of a program be considered when evaluating potential environmental impacts for an EA or EIS. CEQ defines cumulative effects as:

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7).

Cumulative effects most likely arise when a relationship exists between a proposed action and other actions expected to occur in a similar location during a similar time period. The geographic boundaries

considered in the cumulative effects analysis will be limited to the counties where lands are eligible for enrollment in CREP as well as water resources that are located downstream of eligible CREP land. The time frame to be considered in the cumulative effects analysis will be 10 years, the maximum term of a NCV CREP contract.

3.15.2 Past, Present, and Reasonably Foreseeable Actions

Actions overlapping with, or in proximity, to the proposed action are most likely to have the potential to result in cumulative effects. In addition, programs similar to CREP are also likely to have a cumulative effect. For these reasons and for consideration at the programmatic level, only conservation programs that provide financial or technical assistance to private landowners and are designed to mitigate impacts to natural resources are analyzed for cumulative effects. These programs include NRCS conservation programs (including the proposed CCP), FWS programs, landowner assistance programs administered by the State of California, and various partnerships involved with conservation in the Central Valley. The cumulative impacts of ongoing agricultural practices will also be analyzed for each resource issue.

NRCS Programs

Environmental Quality Incentives Program (EQIP): The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that supports production agriculture and environmental quality as compatible goals. It provides financial and technical assistance to farmers and ranchers who install CPs that address natural resource concerns on agricultural lands (NRCS 2005).

In 2004, $56,981,700 was provided for conservation planning, design and installation on cropland, grazing land, and animal feeding operations for 1,901 contracts. Projects include noxious weed control, brush management, pasture hayland planting, terraces, and groundcover installation. In fiscal year 2005, California received $62,114,391 for this program (NRCS 2005).

Grassland Reserve Program (GRP): Grassland Reserve Program (GRP) helps landowners and operators restore and protect grassland including rangeland and pastureland and certain other lands, while maintaining the areas as grazing lands. In 2004, seven contracts totaling 6,187 acres were approved by the State. In 2005, California received $2,590,000 for this program (NRCS 2005).

Wildlife Habitat Incentives Program (WHIP): This program is used to develop or improve fish and wildlife habitat on private land. In 2994, $1,465,540 was allocated for 30 contracts. In 2005, $1,233,286 was obligated for California habitat (NRCS 2005).

Wetlands Reserve Program (WRP): This program is used for wetland restoration, enhancement, or creation on private land. In 2004, $16,945,000 was provided for 22 contracts for permanent easement of critical wetland and riparian areas on 8,617 acres. In 2005, California received $13,772,228 for this program (NRCS 2005).

Farm and Ranch Land Protection Program (FRLPP): This program is used to help state, tribal, or local government entities purchase the development rights to keep productive farm and ranch land in agricultural use. FRLPP protects agricultural land that is at high risk from development. Development for residential uses could result in much greater nutrient runoff into near-shore waters. In 2004, FRLPP had seven total easements and protected 4,002 acres of land. In fiscal year 2005, California received $4,530,747 for this program (NRCS 2005).

Watershed Protection and Flood Prevention Program: The Watershed Protection and Flood Prevention Act (PL 83-566), as amended, authorized NRCS to cooperate with States and local agencies to carry out works of improvement for soil conservation and for other purposes including flood prevention; conservation, development, utilization, and disposal of water; and conservation and proper utilization of land. In 2005, $318,000 was allocated to the State of California for this program (NRCS 2005).

Conservation Security Program (CSP): The Conservation Security Program (CSP) is a voluntary program that provides financial and technical assistance to promote the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes on tribal and private working lands. Working lands include cropland, grassland, prairie land, improved pasture, and range land, as well as forested land that is an incidental part of an agriculture operation. In 2005, five watersheds were eligible for enrollment. An estimated 6,797 farms were involved covering an estimated 2,361,000 acres. Watersheds in eight of the CREP counties were involved in the 2005 allocation. In 2006, watersheds in five of the CREP counties are authorized, involving three watersheds and approximately 399,411 acres (NRCS 2005).

Other Landowner Assistance Programs and Partnerships

Conservation Reserve Program: The CRP provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the CCC and is administered by FSA and CREP is a component of the CRP. In fiscal year 2004, 146,954 acres were enrolled in CRP in California using approximately $4,700,000 (FSA 2005).

Central Valley Habitat Joint Venture: The CVHJV was established in 1990 to carry out North America Waterfowl Management Plan objectives in the Central Valley. The CVHJV's objectives are:

- Establish dense nesting cover on idle agricultural lands,
- Restore former wetlands, and
- Enhance existing wetlands (Proposal 2000).

While substantial wetland restoration has occurred in the Central Valley since the CVHJV was established, very little has been done to establish upland cover for wildlife in the agricultural region of the NCV. CREP is essential to accomplishing the CVHJV upland nesting cover habitat objectives (Proposal 2000).

The Inland Wetlands Conservation Program: The Inland Wetlands Conservation Program (IWCP) was created within the Wildlife Conservation Board in 1990, with the goal to carry out the mandates of the CVJV by increasing waterfowl populations in California's Central Valley through the protection, restoration, enhancement, and maintenance of wetland habitat. The IWCP has a basic mission to create and implement conservation efforts that make economic as well as social and environmental sense. The creation of the IWCP recognized the importance of public and private partnerships in forming coalitions necessary to implement the very specific CVJV objectives. Working in conjunction with other CVJV partners, the program has proven to be highly effective at protecting and restoring wetlands in the Central Valley (WCB 2005b).

Partners in Flight: The improved wildlife habitat in the CREP project area will also contribute to the achievement of the objectives of Partners in Flight, an international effort to restore migratory bird populations. Partners in Flight has specifically identified as high priority the restoration of grasslands and riparian habitats to reverse the decline of numerous bird species that use the Central Valley (Proposal 2000).

Riparian Habitat Joint Venture: California Partners in Flight initiated the Riparian Habitat Joint Venture (RHJV) project in 1994. To date, eighteen Federal, State and private organizations have signed the Cooperative Agreement to protect and enhance habitats for native landbirds throughout California. Through board meetings, workshops, presentations and networking the RHJV provides a forum where members, as well as other organizations, can develop new collaborative opportunities for planning,

funding, and implementing riparian conservation projects. The collective knowledge of member organizations promotes a unified approach to developing effective standards and guidelines to achieve more successful riparian conservation across the State (RHJV 2005).

Permanent Wetland Easement Program: PWEP, administered by the CDFG in cooperation with the State Wildlife Conservation Board, is a program that directly partnering with the CREP. Up to 1,500 acres of wetlands have been or will be enrolled in PWEP on land adjacent to CREP uplands. This program pays willing landowners approximately 50-70 percent of their properties fair market value for farming and development rights in perpetuity and its main focus is wildlife habitat conditions and management (CWA 2005 and Plumb 2005a).

Conservation Easement Program: The Conservation Easement Program, administered by FWS, will pay willing landowners approximately 40-60 percent of their property's fair market value to purchase the farming and development rights in perpetuity. While farming and development are prohibited on easement lands, the landowner retains many rights including: trespass rights, mineral rights, grazing rights, the right to hunt and/or operate a hunting club, and the ability to pursue other types of undeveloped recreation. Landowners are not required to follow a management plan, but they are encouraged to participate in various programs for habitat restoration, enhancement, and management (CWA 2005).

California Waterfowl Habitat Program (Presley Program): Created by the California Waterfowl Habitat Preservation Act of 1987, this program supports landowners' efforts to preserve and enhance their wetland waterfowl habitat. Participating landowners receive $20 an acre per year for entering into a wetland conservation agreement with the CDFG for an initial period of ten years to protect and manage their wetland property for the benefit of waterfowl (CERES 2005b).

Agricultural-Waterfowl Incentive Program (B22 Program): The Agricultural-Waterfowl Incentive Program, administered by FWS, provides agricultural landowners an annual financial incentive to flood their lands at appropriate times (e.g., winter, spring/summer) to provide waterfowl habitat. Priority is given to lands which are farmed for small grains (i.e. rice, wheat, corn) and are in the vicinity of high waterfowl use areas (CWA 2005).

The Water Bank Program: The Water Bank Program (WBP) was established by Congress in 1970 for several purposes, including:

- to preserve and improve wetlands as habitat for migratory waterfowl and other wildlife,
- to conserve surface waters,
- to reduce runoff and soil erosion,
- to contribute to flood control,
- to improve water quality,
- to increase subsurface moisture, and
- to enhance the natural beauty of the landscape.

Landowners with significant migratory waterfowl habitat on their property can enter into a 10-year agreement with the Agricultural Stabilization and Conservation Service (ASCS) to manage the land so that habitat values will be maintained or improved. NRCS biologists work with landowners to develop a management plan implemented over the life of the agreement. In California, these management programs typically focus on providing nesting, brood-rearing, and wintering habitat for migrating and resident birds, both by planting and by maintaining flooded areas during the appropriate seasons. After the management plan has been designed, the landowner enters into an agreement with the ASCS, committing to the habitat improvements and maintaining them for ten years.

Landowner payment rates vary by county, but the ASCS makes payments to landowners on an annual, per acre basis to help offset management costs (CERES 2005a).

Partners for Fish and Wildlife Program: Since 1987, the FWS's Partners for Fish and Wildlife Program has offered technical and financial assistance to private landowners to voluntarily restore wetlands and other fish and wildlife habitats on their land. The FWS works with a wide variety of partners to restore wildlife habitat on private lands, including other Federal agencies, Tribes, State and local governments, conservation organizations, academic institutions, businesses and industries, school groups, and private individuals. These restored habitats provide important food, cover, and water for Federal trust species (i.e., migratory birds, anadromous fish, T&E species, and other fish, wildlife and plant species that have experienced population declines). Many of these projects are located near existing NWRs or State WMAs, providing increased benefits to fish and wildlife relying on these lands (FWS 2005c).

The California Riparian Habitat Conservation Program: The basic mission of the California Riparian Habitat Conservation Program (CRHCP) to develop coordinated conservation efforts aimed at protecting and restoring the State's riparian ecosystems. The CRHCP is therefore a cooperative effort involving State and Federal agencies, local government, nonprofit conservation groups, private landowners, and concerned citizens. The goals of the CRHCP are to protect, preserve, restore and enhance riparian habitat throughout California (WCB 2005a).

Agricultural Conservation Program: The Agricultural Conservation Program (ACP) was initiated in an effort to reduce soil loss and agricultural contributions to water pollution from both runoff and direct discharge. The program provides cost-share funds for approved practices that provide long-term and community-wide benefits. The practices eligible for cost-share vary, but they may include establishing permanent vegetative cover, restoring shallow water areas or developing new ones, and installing water control structures (CERES 2005a).

Landowner Incentive Program: The California Landowner Incentive Program (LIP) is an effort to reverse the decline of special status species on private lands in California's Central Valley by playing a key role in the enhancement and management of the region's three predominant historic habitat types: riparian, wetland, and native grassland. LIP is a CDFG program funded by the FWS, the coordination of which has been contracted through Ducks Unlimited (CDFG 2005b).

Ongoing Agricultural Activities

Ongoing agricultural practices are discussed in detail in Chapter 2 and impacts to resources from ongoing agricultural practices are discussed in more detail in Chapter 3. These impacts are summarized briefly for each resource below.

Surface Water Resources: Over 90 percent of streams and rivers in the CREP project area are listed on the 2002 303(d) list for a number of pesticides including organophosphate pesticides (CVRWQCB 2005a).

Groundwater Resources: Groundwater contamination has been detected in some areas of the watershed. Contaminants include nitrates, pesticides, and arsenic (CALFED 2000)

Drinking Water Resources: Nitrate contamination is pervasive throughout the State and is found in both surface and groundwater supplies and is the single biggest threat to California's drinking water (LLNL 2002).

Wetlands: The entire Central Valley has lost approximately 95 percent of its historic wetlands. Most of these losses resulted from agricultural conversion and flood control projects (Proposal 2000).

Floodplains: The topography of the Central Valley and surrounding terrain creates flood intensities unseen elsewhere in the nation. Flooding of agricultural land, urban areas, and major transportation is frequent. Inundation of land occurs when levees break or flood protection system is inadequate for flows (Reclamation Board and USACE 2002). In some areas near the Sacramento River, the stream channel is

higher in elevation than the surrounding land surface. This condition can result in water logging of lands adjacent to the river and consequent crop losses due to seepage from the stream channel (CALFED 2000).

Biological Resources: Habitat degradation from human population growth, habitat fragmentation (especially wetland and riparian habitats), invasive exotic species, and pollution continue to threaten T&E species and other species populations.

Cultural / Tribal Resources: California's population expansion and economic growth create development pressures that threaten historic resources, cultural landscapes, and TCPs (OHP 2005b). Much of the area with NCV CREP boundaries is used for agricultural purposes, where the ground surface is regularly plowed, raked, or tilled (CALFED 2000).

Environmental Justice: There are no specific Environmental Justice issues resulting from agricultural activities.

Human Health, Social, and Economic Issues: Besides the men and women who work directly in agricultural jobs, many others work in jobs that support agriculture. Individuals working on farms may be exposed to harmful chemicals and adverse working conditions.

Air Quality: Over 500,000 acres of rice are grown each year in the Sacramento Valley. The post-harvest burning of rice stubble represents the chief agriculture-related air quality concern within the project area. Post-harvest burning results in emissions of smoke and other pollutants that contain inhalable particulate matter (Proposal 2000).

3.15.3 Cumulative Effects Summary

Existing State and Federal conservation programs would continue to strive to collectively improve water quality and wildlife habitat. However, without CREP, a powerful tool in improving water quality and wildlife habitat, the current iterations of these programs would continue to be only as effective as they have in the past. Implementation of Alternative A would result in the continuation of current observable trends in nonpoint source pollution and resource degradation and the cumulative effects that accompany these problems.

Working in conjunction with existing State and Federal programs and partnerships, CREP implementation would contribute to the cumulative improvement of the State's water quality. Likewise, the enhancement of wildlife habitat across CREP watersheds would add to the State's resources and provide additional protection for listed State and Federal species. Wetlands, groundwater, wildlife, and cultural resources would all benefit from the cumulative effects of protection and enhancement that CREP would provide. CREP is designed to augment and enhance conservation of resources and to promote water quality improvement. It would work in conjunction with other conservation efforts being implemented at both the State and Federal level and result in statewide cumulative improvements to California's natural conditions. Cumulative effects for each resource are summarized in Table 3.24.

Table 3.24 Summary of cumulative effects by resource.

Resource Issue	NRCS Programs	Other Programs and Partnerships	Ongoing Agricultural Practices	Cumulative Effects of Alternative A: No CREP	Cumulative Effects of Alternative B: CREP
Surface Water Resources	By removing land from active agriculture, NRCS conservation programs decrease the amount of surface water used for irrigation and other agricultural uses and reduce soil erosion and nutrient and chemical applications. CPs associated with these programs improves water quality by filtering sediments and nutrients from agricultural runoff.	The Water Bank and the Agricultural Conservation Programs are designed to improve surface water conditions by conserving surface water, reducing sediment and pollutant loads in agricultural runoff, and generally improving water quality. Other conservation programs, while not specifically designed to improve water quality, preserve natural habitats, having indirect benefits on water quality including reducing soil erosion and decreasing sediments in surface water.	Ongoing agricultural practices add nutrients, sediment, and cheNCVcals to surface water runoff, degrading water quality of receiving waterbodies and resulting in non-attainment of beneficial use designations. In addition, as land is converted to agriculture, its ability to filter sediments and other pollutants decreases.	Conservation programs and partnerships would collectively strive to mitigate the adverse impacts of land use practices on water quantity and quality.	CREP is designed to complement existing conservation programs and partnerships and would enhance the ongoing water quality improvement efforts of the Water Bank and the Agricultural Conservation Programs. Combined with these and other conservation programs, CREP would result in cumulative benefits to water quantity and quality. Over the 10 years of CREP, sediment and nutrient loads would be expected to decrease as more land is enrolled in CREP and other conservation programs.

Resource Issue	NRCS Programs	Other Programs and Partnerships	Ongoing Agricultural Practices	Cumulative Effects of Alternative A: No CREP	Cumulative Effects of Alternative B: CREP
Groundwater Resources	By removing land from active agriculture, NRCS conservation programs decrease the amount of groundwater used for irrigation and other agricultural uses. In addition, by reducing the amount of agricultural chemicals used in the area, the quality of water recharging groundwater would improve.	These programs and partnerships are not specifically designed to improve groundwater quality; however indirect benefits to water quality would result in improving groundwater recharge and reducing groundwater contamination. In addition, decreased demand for irrigation would increase the NCV's groundwater quantity.	Agricultural practices can contaminate water that recharges aquifers and deplete the amount of groundwater available.	Existing programs and partnerships would continue to work towards reducing contamination of surface water recharging aquifers.	Filtration of sediment, nutrients, pesticides, and pathogens provided by CPs would help improve the quality of groundwater recharge. Combined with other conservation programs and partnerships, CREP would cumulatively have a greater impact on groundwater quantity and quality. If implemented in the same watershed, these programs could complement each other and potentially improve the effectiveness of each program.
Drinking Water	NRCS conservation programs would improve surface water quality, improving the quality of water recharging groundwater and reducing groundwater contamination.	These programs are not specifically designed to improve water quality; however indirect benefits to water quality would result in improving surface water quality and groundwater recharge and reducing groundwater contamination.	Agricultural practices that use agricultural chemicals such as fertilizers and pesticides can contaminate surface water and groundwater sources of drinking water.	Conservation programs and partnerships would collectively strive to mitigate the adverse impacts of land use practices on surface and groundwater quantity and quality, indirectly benefiting the area's drinking water.	Combined with other conservation programs and partnerships, CREP would cumulatively have a greater impact on water quality. If implemented in the same watershed, these programs could complement each other and potentially improve the effectiveness of each program.

Resource Issue	NRCS Programs	Other Programs and Partnerships	Ongoing Agricultural Practices	Cumulative Effects of Alternative A: No CREP	Cumulative Effects of Alternative B: CREP
Wetlands	Specifically, WRP restores, enhances, and protects wetlands. Additional CPs implemented through the different NRCS programs may include restoration of wetlands. NRCS programs also include improvement of wildlife habitat including wetlands.	Many existing conservation programs in the NCV focus on wetland preservation and restoration, including CVHJV, IWCP, PWEP, California Waterfowl Habitat Program, the WBP, and LIP.	Conversion of wetlands to agricultural land leads to loss of wetlands; soil erosion on agricultural land adds sediment to runoff and can lead to sedimentation of downstream wetlands and reduce wetland functions.	Conversion of wetlands to agricultural land and other land uses continues to threaten California's wetlands. Ongoing programs and partnerships collectively strive to protect, enhance, and restore wetlands.	Land enrolled in CPs would enhance preserved and restored wetlands in the NCV and provide the variety of habitat necessary for some wetland species.
Floodplains	NRCS programs restore native vegetation, install riparian buffers, and protect natural habitats, all of which serve to maintain or enhance floodplain functions.	Existing programs and partnerships maintain and preserve native habitat and vegetation, reducing impacts that occur from degradation of natural resources. In addition, flood control is one of the purposes of the WBP.	Agriculture in floodplains may alter floodplain functions and decrease its ability to slow and/or retain floodwaters.	Ongoing conservation programs protect and enhance natural habitats in floodplains, helping to preserve a functioning floodplain. However, these benefits are offset by land uses that occur in floodplains. Agricultural and urban land use in floodplains compact soil and channelize streams, resulting in higher flood volumes and more flood damage downstream.	CREP would complement ongoing conservation efforts in floodplains. Together, these programs would lessen impacts to floodplains. CREP would add additional acres to land already protected or enhanced by conservation programs.

Resource Issue	NRCS Programs	Other Programs and Partnerships	Ongoing Agricultural Practices	Cumulative Effects of Alternative A: No CREP	Cumulative Effects of Alternative B: CREP
Biological Resources	Protection and restoration of natural habitats through NRCS programs provides benefits to protected species in the NCV. Specifically, WHIP is designed to improve wildlife habitat on private land.	The majority of the existing conservation programs and partnerships protect and enhance natural habitats that are important for T&E species and other species, specifically waterfowl species, in the NCV. LIP, specifically targets habitat of T&E species on private land for protection and restoration.	Conversion of land for agricultural purposes has resulted in a decrease in the amount of quality habitat available to T&E species. Sediment and nutrient loads in agricultural runoff impact aquatic species. Land disturbance or fallow agricultural land encourages the establishment of invasive species that out-compete native species and degrade native habitats.	Existing programs and partnerships strive to preserve and restore native habitat, particularly riparian and wetland habitats.	CREP would complement other conservation programs and partnerships that are designed to preserve and protect habitat of native, T&E, and other species. Through CREP, additional acres would be added to those already protected by existing programs and partnerships, increasing the amount of quality habitat available to T&E and other species. In addition, some of the CPs are specifically designed to restore and/or enhance wildlife habitat.
Environmental Justice	NRCS programs are available to all individuals owning eligible land.	Conservation programs and partnerships are available all individuals owning eligible land.	Current agricultural practices do not negatively affect minority or low income populations.	Existing programs and partnerships will continue to be available on eligible land, possibly improving the quality of life for all individuals living in the area.	CREP would complement existing programs and partnerships available on eligible land, possibly improving the quality of life for all individuals living in the area.

Resource Issue	NRCS Programs	Other Programs and Partnerships	Ongoing Agricultural Practices	Cumulative Effects of Alternative A: No CREP	Cumulative Effects of Alternative B: CREP
Human Health, Social, and Economic Issues	Rental rates from NRCS programs would offset the cost of implementation of CPs and the removal of land from active agricultural production. In addition, removal of land from active agriculture would minimally reduce farm worker exposure to agricultural chemicals.	Existing State and Federal programs offer private landowners some monetary compensation for implementing conservation programs. Additional benefits may come from recreational use (e.g. hunting, bird watching, hiking) of restored or conserved natural habitats.	Agriculture provides jobs and adds to the overall economy through the sale of agricultural products. Application of agricultural chemicals may adversely impact farm worker health.	Existing State and Federal conservation programs may increase local income derived from recreational use of land that has been preserved or restored. Monetary compensation would available to private landowners for conservation efforts. Removal of agricultural land from active production may lessen farm worker exposure to agricultural chemicals.	Through CREP, additional funds would be available to landowners. Rental rates would be available to producers for marginal farmland with limited agricultural productivity. Land placed into all conservation programs could enhance recreational value of the land and could increase local income derived from recreation use. Enrolling marginal cropland into CREP and other conservation programs would reduce application of these chemicals, decreasing farm worker exposure.
Air Quality	Although NRCS conservation programs are not designed to improve air quality, the retiring of agricultural land would eliminate agricultural burning, plowing, and other activities that may decrease air quality.	Although not specifically designed to improve air quality, other Federal and State programs encourage native and other desirable permanent plant species, eliminating agricultural burning, plowing, and other activities that contribute to air quality contamination.	Agricultural practices such as burning and plowing contribute to the smoke and dust problems during certain weather conditions.	Current conservation programs provide incentives to either convert agricultural land to native plants or temporarily retire agricultural land, eliminating agricultural burning, plowing, and other activities that contribute to air quality.	The conversion of CREP-enrolled land to CPs would add to the existing and future land enrolled in other conservation programs. By eliminating agricultural practices on more land, air quality in the area would likely improve.

3.16 Unavoidable Adverse Impacts

The following sections describe those effects which are adverse and cannot be avoided without mitigation.

3.16.1 Alternative A (No Action)

Nonpoint source pollution attributed to agriculture would increase over time. Continued agricultural practices would likely contribute to long term water quality degradation in watersheds across the State. There is the probability of increased seasonal erosion accompanied by increased sedimentation in regional streams immediately following harvests. Nutrient loading and waterborne pathogens would continue to impact downstream ecosystems and human populations.

3.16.2 Alternative B (CREP Agreement)

Alternative B would reduce the unavoidable adverse impacts listed under Alternative A by providing filter strips to reduce sedimentation; creating wetlands to help filter contaminants; and reducing the overall use of fertilizers and pesticides.

3.17 Relationship of Short Term Uses and Long Term Productivity

3.17.1 Alternative A (No Action)

This alternative would maximize the short term uses of the environment, but would not enhance the long term productivity of eligible lands. Marginal croplands and pasturelands that might otherwise be enrolled in CREP would stay in production and would drain landowners' resources for continued use. Fertilizers and pesticides used on these lands would remain and contribute to watershed pollution.

3.17.2 Alternative B (CREP Agreement)

Under Alternative B, the short term uses of the human environment would be maximized and long term productivity would be simultaneously enhanced. Marginal croplands would be enrolled in CREP and would provide leveraged benefits to other lands and waterbodies in affected watersheds. Resources used to sustain the marginal lands would be diverted to help maximize the productivity of prime croplands. Potential overuse of fertilizers to increase productivity on marginal lands would be reduced.

3.18 Irreversible and Irretrievable Commitments of Resources

3.18.1 Alternative A (No Action)

Irreversible and irretrievable commitments of resources include fuel and time spent conducting agricultural practices. The irreversible loss of soil resources from the State's agricultural lands would continue at the current or perhaps an accelerated rate due to splash, rill, and streambank erosion.

3.18.2 Alternative B (CREP Agreement)

As with Alternative A, the irreversible and irretrievable commitments of resources including fuel and time spent conducting agricultural practices would continue, though perhaps at a decreased rate. Agricultural soil loss would likely continue, but at a much reduced rate as appropriate CPs are implemented.

Chapter 4.0 List of Preparers

Table 4.1. Name, education, area of expertise, and years experience of those who contributed as part of the interdisciplinary team.

Name	Area of Expertise	Education	Experience
Kim Richardson Barker	Technical Writer/Editor	B.S., Environmental Studies; M.S. Rangeland Science	2 years
Suzanne Hill	Technical Writer	B.S. Watershed Science; M.A. Science Education	3 years
Danielle Healey	Technical Writer	B.A. Biology; M.S. Biology	2 years
Kelson Forsgren	Writer/Editor	B.A., English; M.S., Technical Communication	13 years
James Fortner	FSA Environmental Compliance Manager	B.S., Agriculture and Extension Education	20 years
Kathleen Schamel	FSA Historic Preservation Officer	B.A.; M.A., Anthropology	19 years

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Chapter 5.0 List of Agencies and Persons Consulted and/or Provided Copies of This Environmental Assessment

The following is a list of agencies, individuals, and/or organizations that were consulted during this PEA process:

- California Department of Fish and Game (CDFG)
- California Department of Water Resources (DWR)
- California Waterfowl Association
- Central Valley Habitat Joint Venture (CVHJV)
- Ducks Unlimited
- Larry Plumb, State Conservationist, Farm Service Agency, California
- National Audubon Society
- NRCS State Technical Committee
- Pheasants Forever
- Point Reyes Bird Observatory
- State Historic Preservation Office
- The Nature Conservancy
- U.S. Fish and Wildlife Service (FWS)

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Appendix A: Federal Laws Affecting Agriculture

Clean Water Act of 1972

The CWA was passed in 1972, with a goal to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The Act contains a number of provisions that affect agriculture:

Clean Lakes Program is authorized by Section 314 of the CWA. It authorizes EPA grants to states for lake classification surveys, diagnostic/feasibility studies, and for projects to restore and protect lakes.

Nonpoint Source Pollution Program is established by Section 319 of the CWA. It requires states and U.S. territories to identify navigable waters that cannot attain water quality standards without reducing nonpoint source pollution, and then develop management plans to reduce such nonpoint source pollution.

National Estuary Program is established by Section 320 of the CWA. It provides for the identification of nationally significant estuaries that are threatened by pollution for the preparation of conservation and management plans and calls for Federal grants to states, interstate, and regional water pollution control agencies to implement such plans.

National Pollutant Discharge Elimination System Permit Program is established by Section 402 of the CWA. This program controls point source discharge from treatment plants and industrial facilities (including large animal and poultry confinement operations).

Dredge and Fill Permit Program was established by Section 404 of the CWA. Administered by the U.S. Army Corps of Engineers, it regulates dredging, filling, and other alterations of waters and wetlands jointly with EPA, including wetlands owned by farmers. Under administrative agreement, NRCS has authority to make wetland determinations pertaining to agricultural land.

Endangered Species Act of 1973

The ESA was enacted to conserve threatened or endangered species and the critical habitats in which they exist. When a species is designated as threatened with extinction, a recovery plan that includes restrictions on cropping practices, water use, and pesticide use is developed to protect the species from further population declines. All Federal agencies are required to implement ESA by ensuring that Federal actions do not jeopardize the continued existence of listed species.

The ESA defines an endangered species as one that is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future. T & E designations may be applied to all species of plants and animals, except pest insects. A species may be threatened at the state level, but that same designation does not automatically apply nationwide, as species numbers may be greater in other states.

The FWS and the National Marine Fisheries Service (NMFS) are mandated the responsibility of ensuring that other agencies plan or modify Federal projects so that they will have minimal impact on listed species and their habitats. Section 7 of the ESA requires that project areas must be checked against FWS and state listings of critical habitat and T&E species. FSA ensures that all CREP contract meet this requirement by including T&E species in its environmental review.

The ESA also requires the delineation of the "critical habitat" of sensitive species. Critical habitat is defined by the ESA as areas that are "essential" to the conservation of listed species. Private, city, and state lands are generally not affected by critical habitat until the property owner needs a Federal permit or requests Federal funding. Because the NCV CREP is partially funded by Federal dollars, consultation

with FWS would be required when critical habitat is encountered. Critical habitat designations are published in the Federal Register and can be located at the FWS website—http://endangered.fws.gov/.

Farmland Protection Policy Act (FPPA) of 1981

The aim of the FPPA is to minimize Federal programs (including technical or financial assistance) contribution to the conversion of important farmland to non-agricultural uses. The act seeks to encourage alternative, if possible, that would lessen the adverse effects to important farmlands. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

NRCS uses a land evaluation and site assessment system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. The assessment is completed on form AD-1006, Farmland Conversion Impact Rating.

Federal Insecticide, Fungicide, and Rodenticide Act of 1947

The Federal Insecticide, Fungicide, and Rodenticide Act provides the legal basis under which pesticides are regulated. A pesticide can be restricted or banned if it poses unacceptable risks to human health or the environment. The re-registration process, mandated in 1988 for all active ingredients then on the market, has resulted in manufacturers dropping many less profitable products rather than paying the registration fees.

Food Security Act of 1985

FSA is authorized under this Act, as amended, and 7 CFR 1410 to institute the actions contemplated in this PEA (i.e. the proposed implementation of CREP). The FSA is authorized to enroll land into CREP through December 2007. Sections 1230, 1234, 1242 of the Act and 7 CFR 1410.50 authorize FSA to enter into agreements with states to use the CRP in a cost-effective manner to further specific conservation and environmental objectives of a given state and the nation. The following provisions are especially applicable to the implementation of CREP:

> Highly Erodible Land Conservation Compliance Provisions require that producers of agriculture commodities must protect all cropland classified as being highly erodible land (HEL) from excessive erosion. The provisions were amended in the 1990, 1996, and 2002 Farm Bills. The purpose of these provisions is to remove the incentive to produce annually tilled agricultural commodity crops on HEL unless it is protected from excessive soil erosion.
>
> Wetland Conservation Provisions (Swampbuster) help preserve the environmental functions and values of wetlands, including flood control, sediment control, groundwater recharge, water quality, wildlife habitat, recreation, and aesthetics. The 1996 Farm Bill modified Swampbuster to give USDA participants greater flexibility to comply with wetland conservation requirements and to make wetlands more valuable and functional. The 2002 Farm Bill changed the other Swampbuster provisions, including those associated with wetland determinations, mitigation (offsetting losses), "Minimal Effect" determinations, abandonment, and program eligibility.

National Environmental Policy Act of 1969 and Regulations

NEPA is intended to help Federal officials make decisions that are based on consideration of the environmental consequences of their actions, and to take actions that protect, restore, and enhance the

environment. NEPA mandates that the FSA consider and document the impacts that major projects and programs would have on the environment.

CEQ Implementation Regulations

The NEPA implementation regulations found at 40 CFR 1500.

National Historic Preservation Act of 1966 and Regulations

This National Historic Preservation Act (NHPA) as amended (16 USC 470, P.L. 95-515), establishes as Federal policy the protection of historic properties and their values in cooperation with other nations and with state and local governments. Amendments designated the State Historic Preservation Office (SHPO) or the Tribal Historic Preservation Office (THPO) as the party responsible for administering programs in the states or reservations.

The Act also creates the Advisory Council on Historic Preservation (ACHP). Federal agencies are required to consider the effects of their undertakings on historic resources, and to give the SHPO/THPO and, if necessary, the ACHP a reasonable opportunity to comment on those undertakings.

NHPA Implementation Regulations

The NHPA implementation regulations found at 36 CFR 800, Protection of Historic Properties. This regulation, governing compliance with Section 106 of NHPA must be followed in planning any agency activity and in the ongoing management of agency resources.

Safe Drinking Water Act of 1974

The Safe Drinking Water Act requires EPA to set standards for drinking water quality and requirements for water treatment of public water systems while also requiring states to establish a wellhead protection program to protect public water system wells from contamination by chemicals, including pesticides, nutrients, and other agricultural contaminants.

Sustainable Fisheries Act of 1996

The Sustainable Fisheries Act amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for “essential fish habitat” (EFH) descriptions in Federal fishery management plans, it also requires Federal agencies to consult with National Marine Fisheries Service (NMFS) on activities that may adversely affect EFH. Under the Magnuson-Stevens Act, NMFS must be consulted by any Federal agency undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location.

Wild and Scenic Rivers Act of 1968

The purpose of the National Wild and Scenic Rivers Act (NWSRA) is to preserve the free-flowing state of rivers that are listed in the National Wild and Scenic Rivers System or under study for inclusion in the System because of their outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Rivers in the System are classified as wild river areas, scenic river areas, or recreational river areas. The NWSRA establishes requirements applicable to water resource projects and protects both the river, or river segments, and the land immediately surrounding them. Section 7 of the WSRA specifically prohibits Federal agencies from providing assistance for the construction of any water resources projects that would adversely affect Wild and Scenic Rivers.

Section 5 (d) of NWSRA requires the National Park Service to compile and maintain a Nationwide Rivers Inventory, a register of river segments that potentially qualify as national wild, scenic or recreational river

areas. A river segment may be listed on the Nationwide Rivers Inventory if it is free-flowing and has one or more "outstandingly remarkable values." All agencies are required to consult with the National Park Service prior to taking actions which could effectively foreclose wild, scenic or recreational status for rivers on the Nationwide Rivers Inventory .

Executive Order 11514: Protection and Enhancement of Environmental Quality

This EO directed the Federal government to provide leadership in protecting and enhancing the quality of the nation's environment to sustain and enrich human life. Federal agencies were directed to initiate measures needed to direct their policies, plans, and programs so as to meet national environmental goals. In order to achieve these goals agencies were directed to:

- Monitor, evaluate, and control on a continuing basis their activities so as to protect and enhance the quality of the environment;
- Encourage timely public information processes to foster understanding of Federal plans and programs with environmental impact;
- Insure that information regarding existing or potential environmental issues be shared and coordinated with other; and
- Comply with the regulations issued by the CEQ.

Executive Order 11988: Floodplain Management—Floodplains and Wetlands

EO11988 requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for the following actions:

- Acquiring, managing, and disposing of Federal lands and facilities;
- Providing federally-undertaken, financed, or assisted construction and improvements;
- Conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities

Each Federal agency is responsible for preparing implementing procedures for carrying out the provisions of the Order. Federal Agencies consult with FEMA concerning implementation of this EO.

Executive Order 11990: Protection of Wetlands

In order to protect wetlands, EO 11990 was signed. EO 11990 sought to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands" and minimize “to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.” To meet these objectives, the EO requires Federal agencies, in planning their actions, to:

- Avoid and minimize direct or indirect loss of wetlands whenever there is a practicable alternative
- Achieve a no net loss of wetland quantity and quality through wetland replacement
- Preserve and enhance the natural and beneficial values of wetlands

Executive Order 12898, Environmental Justice for Minority and Low Income Populations

EO 12898 directs Federal agencies "to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States." Each Federal agency must make achieving environmental justice one of their goals particularly when such analysis is required by NEPA. The EO and guidance emphasize the importance of NEPA's public participation process, directing each Federal agency to provide opportunities for community input in the NEPA process by providing access to public documents and providing notices and hearings

Executive Order 13061, Federal Support of Community Efforts along American Heritage Rivers

EO 13061 established the American Heritage Rivers Initiative. The Initiative has three objectives: natural resource and environmental protection, economic revitalization, and historic and cultural preservation. Executive agencies, to the extent permitted by law and consistent with their missions and resources, shall coordinate Federal plans, functions, programs, and resources to preserve, protect, and restore rivers and their associated resources important to our history, culture, and natural heritage. Agencies are encouraged, to the extent permitted by law, to develop partnerships with state, local, and tribal governments, community and non-governmental organizations.

Comprehensive State Groundwater Protection Program

The program was initiated by EPA in 1991. It coordinates the operation of all Federal, state, tribal, and local programs that address groundwater quality. States have the primary role in designing and implementing the program based on distinctive local needs and conditions.

USDA Departmental Regulation 9500-3

Section 1540 (c) of the Farmland Protection Policy Act and DR 9500-3 established four general categories of farmlands meriting Federal protection. They are cumulatively referred to as "important farmland." Important farmland categories are:

- Prime
- Unique
- Farmland of statewide importance
- Farmland of local importance

DR 9500-3 also made it USDA policy to promote land use objectives responsive to current and long-term economic, social, and environmental needs.

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Appendix B: FSA Handbook Conservation Practices

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Appendix C: Biological Opinion

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