CHAPTER I

Introduction

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MID-PACIFIC REGION

CHAPTER I

INTRODUCTION

A. STUDY AUTHORITY

The Refuge Water Supply study is being conducted under the authority of the Reclamation Act of June 17, 1902 and Public Law 99-546 (Coordinated Operation Agreement).

B. PURPOSE, SCOPE, AND OBJECTIVES OF REFUGE WATER SUPPLY STUDY

The U.S. Bureau of Reclamation (Reclamation) assisted by the U.S. Fish and Wildlife Service (Service) and the California State Departments of Fish and Game (DFG) and Water Resources (DWR), is conducting the Refuge Water Supply Study to investigate and identify potential water sources and delivery systems for providing a dependable water supply to 10 National Wildlife Refuges (NWR), 4 State Wildlife Management Areas (WMA), and private wetlands within the Grassland Resource Conservation District (GRCD), in California, as previously shown in Figure S-1. The Refuge Water Supply Study was initiated in October 1985 as an extension of the Central Valley Fish and Wildlife Management Study's special study on "Refuge Water Supply, Central Valley Hydrologic Basin, California." The Grassland Water District also participated in the study and shared in study costs through funding provided by the California Waterfowl Association.

The study was organized to meet the following primary objectives for each refuge:

1. Confirm and update monthly water requirements based on four water delivery regimes.

2. Determine resources response and recreation use for each water supply regime.

3. Determine groundwater quantity and quality and identify conjunctive use potential.

4. Determine contractual and physical capabilities of water and irrigation districts to deliver water on a monthly basis.

5. Provide preliminary designs and associated costs of delivery systems for each water regime.

6. Evaluate power requirements for delivery systems and wells under each water regime.

7. Develop alternative plans based on water regimes.

8. Develop environmental account for each plan.

C. DESCRIPTION OF STUDY AREA

The study area is located in California's Central Valley. This valley forms a cleft in the middle of California and is one of the world's largest valleys, over 400 miles long and 50 miles wide. Geologically, it is a trough between the Coast Ranges and the Sierra Nevada, with the Cascades bordering it above and the Tehachapi Range below. The valley drains through two great river systems which have created two distinct valleys: the Sacramento and the San Joaquin.

The Central Valley is the world's richest agricultural region with rice and hops more commonly growing in the Sacramento Valley, while grapes and cotton characterize the more intensely developed San Joaquin Valley. Although two centuries ago most of the valley's land would have been considered semi-desert, it is now the richest agricultural region on earth, producing more than 200 crops and 25 percent of all table foods consumed in the United States. Agriculture is not the only industry in the Central Valley, but it dominates the social characteristics.

The Central Valley is one of the fastest growing regions in the United States. However, despite the fact that thousands of acres are lost each year to urban development, the valley has retained much of its rural atmosphere and cultural values.

The one resource conservation district and the Federal and State refuges are located in the Central Valley within the specific valleys and counties listed below.

Refuge	County
Sacramento Valley	
Modoc NWR	Modoc
Sacramento NWR	Glenn
Delevan NWR	Colusa
Colusa NWR	Colusa
Sutter NWR	Sutter
Gray Lodge WMA	Butte
San Joaquin Valley	
Grassland RCD	Merced
Volta WMA	Merced
Los Banos WMA	Merced
Kesterson NWR	Merced
San Luis NWR	Merced

Merced NWR	Merced
Mendota WMA	Fresno
Pixley NWR	Tulare
Kern NWR	Kern

D. PROBLEMS AND NEEDS

The major issue addressed by the refuge study is the need to provide water to the refuges to maintain or enhance wildlife habitat within the Pacific Flyway. Wildlife habitat includes wetlands, riparian vegetation, and uplands. Since 1850, the amount of wetlands in the Central Valley has decreased from 4 million to about 300,000 acres. Private duck clubs own about two-thirds of this acreage. The remaining land is located in National Wildlife Refuges and State Wildlife Management Areas. During high flood years, the amount of wetlands may increase to 700,000 acres. However, management of existing wetland habitat during dry years is essential for consistent waterfowl populations, especially ducks and swans. Riparian woodlands provide nesting habitat, cover, and food areas for ducks, especially wood ducks. As with wetlands, the historical acreages of riparian woodlands have been reduced to 10 to 15 percent of the original acreages. To benefit waterfowl, the riparian vegetation cannot be located far distances away from wetlands.

Upland habitat is important for nesting cover, especially for resident dabbling ducks, such as mallards, gadwall, cinnamon teal, northern shoveler, and pintails. Upland vegetation adjacent to wetlands is preferable. However, bireds will use vegetation found along fences, ditches, levees, and in fields.

The single most important role of the Central Valley wetlands and associated riparian and upland corridors is to provide wintering habitat. In September, the waterfowl population begins to increase and continues to peak of over 12 million birds in December. The population declines to less than one million by February. Some of the most important species from a biological perspective (numbers or impact on the environment) and/or economic factors (consumptive uses) are whistling swans, lesser snow geese, Ross geese, Pacific white-fronted geese, Canada geese, pintails, mallards, American wigeons, green-winged teal, shovelers, gadwalls, and canvasbacks. Other species that occur in significant number include wood ducks and ring-necked ducks. Small numbers of redheads, cinnamon teals, common goldeneyes, buffleheads, mergansers, and lesser scaups and present in limited number. Most wintering waterfowl move among the wetlands in the Central Valley in response to weather changes, water conditions, food availability, and season.

The wetlands and associated habitat are also important to several threatened and endangered species, such as American pergrine falcon, bald eagle, Aleutian Canada goose, San Joaquin kit fox,

blunt-nosed leopard lizard, giant garter snake, and sandhill crane. In addition, these areas provide habitat for unique species such as yellow-billed cuckoo, white pelicans, common and snowy egrets, grebes, greater and lesser sandhill herons, American bitterns, American avocets, black-necked stilts, common snipes, long-billed curlews, and tricolored blackbirds.

E. STUDY ORGANIZATION AND MANAGEMENT

The Refuge Water Supply Study is being conducted as an interdisciplinary interagency study. Study organization and areas of responsibility are shown on Figure I-1. A glossary of terms used in this report is presented in Attachment A.

F. PUBLIC PARTICIPATION

The Refuge Water Supply issue has been long standing and is of significant importance to refuge managers and the public, as the quality and quantity of water available to each refuge ultimately determines the desireability of habitat for migratory birds and resident wildlife. The degree to which these wetland areas are successfully managed is of biological, hydrological, economical, recreational, and educational importance to the state of California, as well as other states and countries along the Pacific Flyway.

Public interest in the development of firm water supplies for Central Valley refuges is very high as evidenced by inquiry and participation in study activities by individuals, environmental, and wildlife organizations and representatives of the state and Federal legislature.

Since the initiation of the Refuge Water Supply Study in October 1985, numerous meetings have been held with cooperating agency staff and management, environmental and wildlife organizations, and water and irrigation districts to discuss study objectives, issues and concerns, and planning procedures. Two Public Information Documents have been released to provide information on the progress of the study and to solicit public input on alternative water delivery plans and pertinent issues. Response has generally been favorable and supportive of the study. Public participation is discussed in greater detail in Chapter V, Conlultation and Coordination, and in Appendix D, Public Involvement.

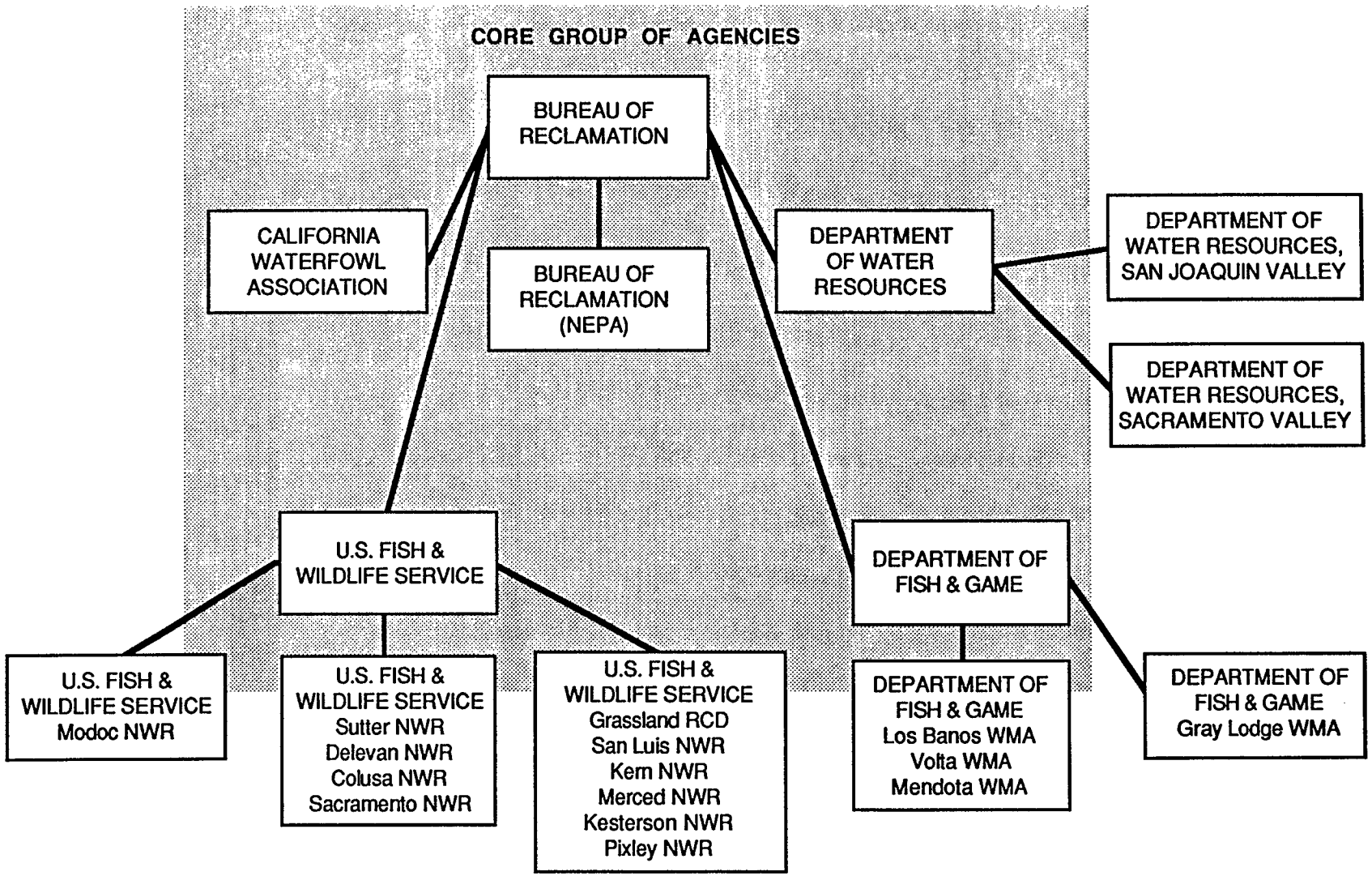

FIGURE I-1

REFUGE WATER SUPPLY INVESTIGATION
STUDY ORGANIZATION

G. COST SHARING

Preliminary informal discussions with the Service, DFG, and private organizations such as the California Waterfowl Association, Ducks Unlimited, and the Audubon Society indicate that there are substantial opportunities to obtain cost sharing funds to assist in the development of refuge water delivery facilities and perhaps to pay for annual water and power costs.

A letter of inquiry has been submitted to all agencies and organizations which may have an interest in assuring dependable supplies of water for refuges. The letter requests that potential funding sources and programs for this purpose be identified and asks for indication of intent to participate in a cost-sharing program. The replies to the inquiry will be included in an appendix to the Reguge Water Supply Planning Report.

H. RELATED INVESTIGATIONS

The Refuge Water Supply Study is one of numerous studies that have been conducted by various agencies and organizations addressing the problems of waterfowl management and loss of wetland habitat occurring in the Central Valley over the past quarter century. The relationship of the Refuge Water Supply Study to other ongoing Reclamation investigations is shown on Table I-1. These reports include ongoing studies by the State of California and private organizations. In addition, a considerable amount of legislation and programs affecting Central Valley habitat has been written.

Background to Present Study

A series of Reclamation studies have addressed fish and wildlife problems related to the Central Valley Project or other water and land activities within the Central Valley. In 1978, as part of its Total Water Management Study for the Central Valley Basin of California, Reclamation published Working Document No. 12, "Fish and Wildlife Problems, Opportunities, and Solutions," a survey of major fish and wildlife problems and improvement opportunities within the geographical area encompassed by the Central Valley Project.

Based on the data developed in Working Document No. 12, Reclamation in 1979 initiated the Central Valley Fish and Wildlife Management Study, a broad-based, interagency, appraisal-level study to develop a comprehensive baseline on the Central Valley's fish and wildlife resources and to propose solutions to water-related problems and issues. Two reports addressing waterfowl or waterfowl habitat were completed: New Waterfowl Habitat Potential within the Central Valley, California, September 1986; and Refuge Water Supply, Central Valley Hydrologic Basin, California

TABLE I-1

RELATIONSHIP OF REFUGE WATER SUPPLY STUDY TO OTHER INVESTIGATIONS

Study	Location	Purpose	Scope	Environmental Issues	Legal and Institutional Constraints	Status
Refuge Water Supply Study and Planning Report	Central Valley	To investigate and identify potential water sources and delivery system for 15 wildlife areas and identify a preferred alternative(s) for providing a reliable water supply to each wildlife area within existing constraints.	Scope includes: (1) Analysis of resource responses to various quantities of water delivery. (2) development of water supply alternatives. Site specific and cumulative impacts will be addressed in appropriate water marketing environmental statement.	o Water quality o Endangered species o Preservation of wetlands o Impacts to Pacific Flyway	o Water rights o Contractual restrictions on CVP water and power availability	Report on Refuge Water Supply Investigations Draft R Sept 1987 Final R Dec 1987 Draft PR Sept 1988 Final PR Dec 1988
Sacramento River Water Contracting Environmental Impact Statement	Sacramento River Basin	To address options for fulfilling both the near- and long-term Sacramento River are agricultural, municipal, and environmental water needs that could be serviced with CVP water from Shasta and Clair Engle Reservoirs, and cumulative impacts of meeting those needs.	Includes: (1) Water users in the Sacramento River CVP service area with needs for water that cannot be satisfied with safe yield ground water or enhanced conservation; (2) the direct, secondary, and cumulative impacts expected to occur as a result of a range of federal water marketing alternatives; (3) the conjunctive use aspect of the Refuge Water Supply Study and the cumulative impacts of providing water to the wildlife areas.	o Cumulative impacts to Delta o Altered flows o Fish migration & production o Bank protection o Riparian/wildlife habitat o Endangered species o Water quality	o Water rights transfers o CDA standards for Delta o Conjunctive use o Rate Setting policy	Draft EIS May 1988 Final EIS Oct 1988 ROD Dec 1988
American River Water Contracting Environmental Impact Statement	American River Basin	To address options for meeting near- and long-term agricultural, municipal and environmental water needs in the American River Basin that could be served with CVP water and impacts on instream flows of meeting those needs.	Includes: (1) Water users in the American River service area, including downstream water uses; (2) cumulative impacts expected to occur as a result of a range of federal water marketing alternatives.	o Lower American River flows o Fish and wildlife o Water quality o Recreation o Delta	o Present water rights as affected by D-1400 and D-893	Draft EIS May 1988 Final EIS Oct 1988 ROD Dec 1988
Delta-Export Water Contracting Environmental Impact Statement	CVP Service Area South of Delta	To identify water needs within the valley and analyze impacts of alternative marketing plans	Full scope of study has not yet been identified. The full range of issues will be discussed in agency and public scoping meetings to be scheduled later in 1987. Valley refuges, Mid-Valley Canal, and wheeling of water through State of California plants are issues presently identified.	Full scope of environmental issues not yet identified. Issues will include impacts to the Delta and drainage	Unknown at this time	Draft EIS May 1988 Final EIS Oct 1988 ROD Dec 1988
Consolidated and Expanded Place of use Environmental Impact Report	Existing and Potential CVP Service Area	To consolidate the CVP place of use and allow water from each permit area to be used consistent with existing water rights anywhere in the CVP; conform the purpose of use to allow a full range of uses in each of the user's water rights permits, expand the place of use to officially permit service to areas already being serviced outside the existing permitted place of use; and extend time required to complete water marketing.	Generic/programmatic overview of where the broader issues (Delta, future expansion) will be covered; detailed site-specific treatment of the potential impacts of Reclamation and/or SWRCB actions in the area.	o Relationship to other Reclamation petitions and water marketing program o Cumulative impacts on fish and wildlife o Impact of expansion o Impact of service areas outside expanded place of use	This is an EIR being prepared for the SWRCB's use. No new water deliveries by Reclamation into the expanded place of use until environmental compliance is completed for the specific place of use.	Tentative Draft EIR Sep 1987 Final EIR Feb 1988 ROD Apr 1988 (By SWRCB)
Offstream Storage Study	Potential Offstream Reservoir Sites	To provide additional water for the CVP and to evaluate methods to combine offstream storage with existing facilities to increase system capacity south of Delta and reduce independence on surface water development.	Scope includes: (1) New and previously examined offstream storage sites in the Central Valley; (2) integration of waterfowl habitat return flows with agricultural deliveries.	o Additional Delta imports o Water quality o Impacts to wildlife habitat o Threatened & endangered species o Drainage & instream flows	o CVP place of use o Corps permits o Additional point of diversion o Water quality & water rights o Groundwater management	Tentative PFWD Dec 1987 PR/DES Apr 1988 RDPR/DES Sept 1988 PR/FES Oct 1989
San Joaquin Valley Drainage Program	Complete Watershed of the San Joaquin River, including the Tulare Lake Basin	To evaluate alternatives for the completion of drainage facilities of the San Luis Unit and adjoining Delta-Mendota Canal service area of the CVP.	Scope includes all areas potentially affected by discharge and management of agricultural drainage water from the San Joaquin Valley.	o Public health o Water quality o Agricultural productivity o Wetlands/wildlife habitat o Drainage transport & disposal	o Water contracts o SWRCB regulations o Pacific Flyway treaties o Public health standards	Draft Phase I - Oct 1987 Final Phase I - Oct 1988 Draft Phase II - Oct 1989 Final Phase II - Oct 1990

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1986. The latter study investigated and identified water needs and sources of dependable water supply for 12 refuges in the Central Valley and served as a primary resource document for water supply investigations presented in this report.

Other Reclamation Studies

The Refuge Water Supply Study interacts with many other water resource studies currently underway in the Central Valley. One of the most significant studies involves the preparation of Environmental Impact Statement's (EIS) for water contracting of noncommitted Central Valley Project water in the Sacramento River Basin, American River Basin, and basins requiring delta export of water, including the San Joaquin and Pajaro Valleys. The EIS's will address the options for fulfilling water needs for agricultural and municipal users as well as refuges. The Off-Stream Storage Investigation is evaluating plans for management of agricultural drainage water by the refuges. The Drainage Program is being prepared by an Interagency Group which includes Reclamation, Service, U.S. Geological Survey, DFG and DWR.

The National Environmental Policy Act (NEPA) requirements for site specific and cumulative impacts associated with water delivery and allocation to the wildlife areas are being addressed in the Sacramento River and Delta Export Water Contracting Environmental Statements.

Coordinated Operation Agreement

On October 27, 1986, Congress enacted Public Law 99-546, which authorized the Secretary of the Interior to enter into and implement the Coordinated Operation Agreement between the Federal Central Valley Project and the State Water Project. The agreement provides a basis for building consensus around development issues in California and allows coordination of the two projects to meet State Water Resources Control Board Decision 1485 water quality standards. Section 104 stipulates that 25 percent of the firm yield of the Central Valley Project currently not committed under long-term contracts is to be reserved until one year after the Secretary of the Interior transmits a report on Refuge Water Supply Investigations in the Central Valley Basin to Congress.