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Price - San Rafael Rivers Unit, Utah, Planning Report / Final Environmental Impact Statement, Colorado River Water Quality Improvement Program / Colorado River Salinity Control Program

United States Department of the Interior, Bureau of Reclamation and United States Department
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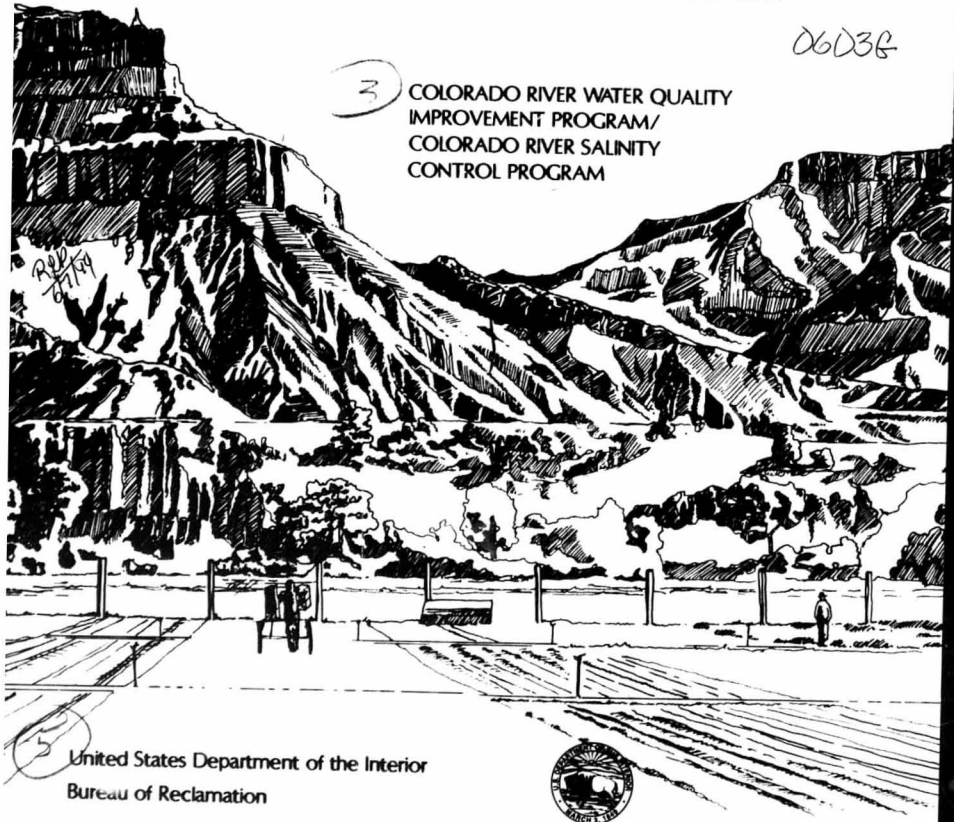
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PRICE - SAN RAFAEL RIVERS UNIT, UTAH

②A PLANNING REPORT/ FINAL ENVIRONMENTAL IMPACT STATEMENT

③ COLORADO RIVER WATER QUALITY IMPROVEMENT PROGRAM/ COLORADO RIVER SALINITY CONTROL PROGRAM

0603R



⑤ United States Department of the Interior
Bureau of Reclamation



United States Department of Agriculture
Soil Conservation Service
PUB. 94-032-760
REF 4U 221072



⑥
DECEMBER 1993

MISSION STATEMENTS

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

This report was prepared pursuant to the Colorado River Basin Salinity Control Act of June 24, 1974, as amended, and summarizes findings of studies to date. Publication of the findings and recommendations herein should not be construed as representing either the approval or disapproval of the Secretary of the Interior.

C-2

PLANNING REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT

*Price-San Rafael Rivers Unit
Colorado River Water Quality Improvement Program
Colorado River Salinity Control Program*

Carbon and Emery Counties, Utah

U.S. Department of the Interior
Bureau of Reclamation, Upper Colorado Region (Reclamation)
U.S. Department of Agriculture
Soil Conservation Service (SCS)

This document presents and evaluates alternative plans and potential impacts of those plans to reduce or curb the increase of salt contributed to the Colorado River system from agricultural lands in the project area. This Planning Report / Final Environmental Impact Statement includes an analysis of existing irrigation practices, salt-loading mechanisms, the planning process, and environmental impacts. Under the preferred plan, irrigation on approximately 36,000 acres would be improved, primarily with sprinkler systems, and agricultural water would be eliminated from open conveyance systems during the winter. In preparing the interdependent plan, Reclamation's off-farm activities focused on the main canal irrigation system, while SCS' activities were directed toward onfarm irrigation features. Reclamation would pressurize only those lateral systems under contract with SCS for significant farmer participation.

Applicable statutory and regulatory requirements to be satisfied by this document include: Executive Orders 11988 and 11990, Floodplain Management and Protection of Wetlands; Endangered Species Act, Section 7 Consultation; Clear Air Act; Colorado River Basin Salinity Control Act; Archeological and Historic Preservation Act, 16 USC et seq.; Fish and Wildlife Coordination Act; National Environmental Policy Act; and Farmland Protection Policy Act. The document also will be used to obtain construction authorization for off-farm features. Onfarm features are authorized for construction under Public Law 93-320, as amended by Public Law 98-569.

For further information, please contact the Regional Director, Bureau of Reclamation, 125 South State Street, P.O. Box 11568, Salt Lake City, Utah 84147, or call (801) 524-5580; or contact the State Conservationist, Soil Conservation Service, 125 South State Street—Room 4012, Salt Lake City, Utah 84147, or call (801) 524-5050.

Date filed with Environmental Protection Agency: _____

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Price - San Rafael Rivers Unit, Utah

**Planning Report /
Final Environmental Impact Statement**

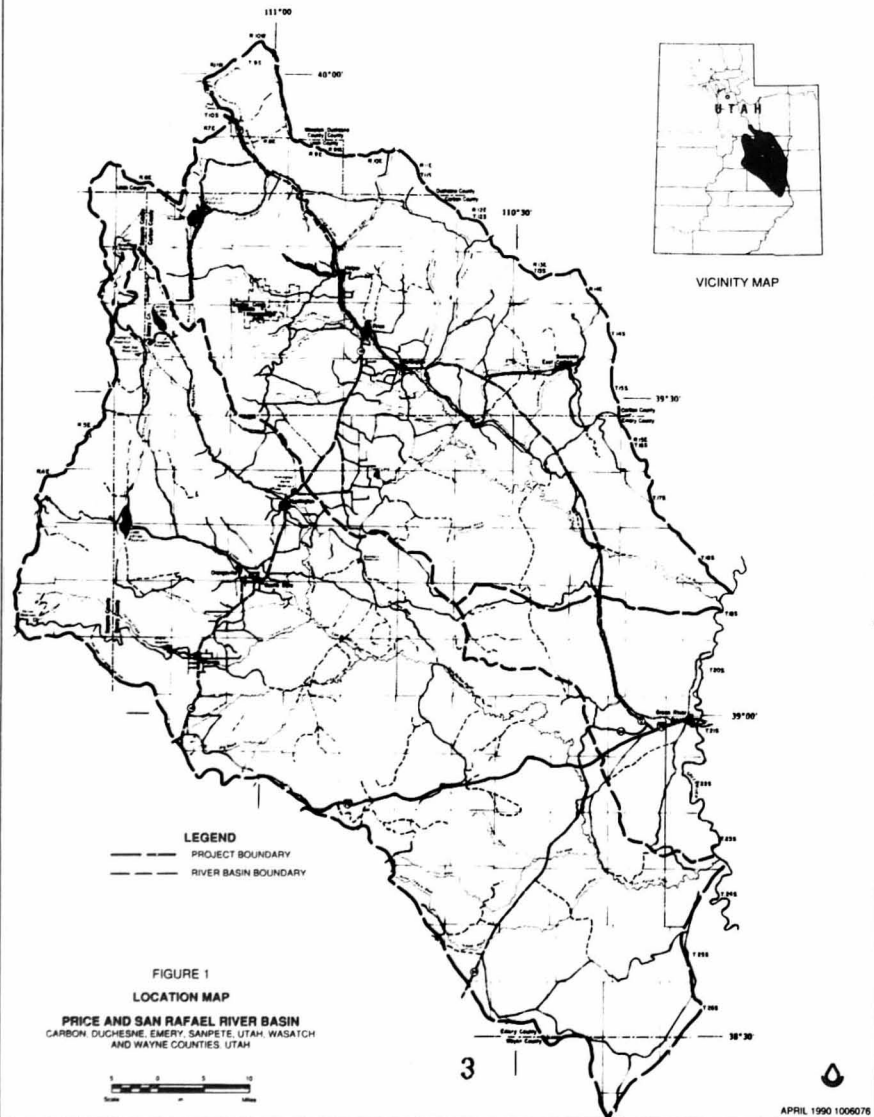
Colorado River Water Quality Improvement Program/
Colorado River Salinity Control Program

United States Department of the Interior
Bureau of Reclamation

United States Department of Agriculture
Soil Conservation Service

December 1993

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SUMMARY

SUMMARY

INTRODUCTION

The Price-San Rafael Rivers Unit (Unit) of the Colorado River Water Quality Improvement Program and Colorado River Salinity Control would reduce salt contribution to the Colorado River by about 161,000 tons annually, through a system of onfarm and off-farm irrigation improvements jointly implemented by the U.S. Department of Agriculture (USDA) and Bureau of Reclamation (Reclamation). The combined cost effectiveness of the program would be \$39 per ton of salt removed.

The Unit would treat some 16,350 acres of farmland in central Utah with gravity-pressure sprinkler irrigation; about 9,650 acres with pump pressure sprinkler systems; and 10,050 acres with improved surface irrigation systems. The acreages would also receive improved irrigation water management. In addition, water would be eliminated from all open conveyance systems in the project area during the winter (nonirrigation) season.

Unit studies included an analysis of existing irrigation practices and salt-loading mechanisms in the project area, development of alternatives for reducing the salt contribution, identification of potential beneficial uses of saline water, evaluation of alternatives, and selection of a preferred plan. Reclamation's off-farm activities focused on the main canal irrigation system, while the Soil Conservation Service's (SCS) activities were directed toward onfarm irrigation features; the onfarm and off-farm features are, however, interdependent.

PROBLEMS AND NEEDS

At its headwaters in the mountains of north-central Colorado, the Colorado River has a salinity concentration of 50 milligrams per liter (mg/L). The concentration progressively increases downstream as a result of water diversions and salt contributions from a variety of sources. Annual salinity concentrations at Imperial Dam are estimated to increase from the 1987 measured average level of 850 mg/L to an average of 970 mg/L by 2010 unless additional control measures are implemented to prevent the salinity increase.

Although a number of water quality-related legislative actions have been taken on the State and Federal levels, four Federal acts are of special significance to the Colorado River Basin—the Water Quality Act of 1965 and related amendments, the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), the Colorado River Basin Salinity Control Act of 1974 as amended, and the Clean Water Act of 1977 as amended.

The Water Quality Act of 1965 (Public Law 89-234) amended the Federal Water Pollution Control Act and established a Federal Water Pollution Control Administration (now the Environmental Protection Agency [EPA]). Among other provisions, it required States to adopt water quality criteria for interstate

Summary

waters inside their boundaries. The seven Basin States initially developed water quality standards that did not include numeric salinity criteria for the Colorado River primarily because of technical constraints. In 1972, the States agreed to a policy that called for the maintenance of salinity concentrations in the Lower Colorado River System at or below existing levels, while the Upper Basin States continued to develop their compact-apportioned waters. The States suggested that Reclamation should have primary responsibility for investigating, planning, and implementing the proposed Colorado River Basin Salinity Control Program.

The enactment of the Federal Water Pollution Control Act Amendments of 1972 affected salinity control in that the legislation was interpreted by EPA to require numerical standards for salinity in the Colorado River. In response, the Basin States founded the Colorado River Basin Salinity Control Forum (Forum) to develop water quality standards including numeric salinity criteria and a basinwide plan of implementation for salinity control. The Basin States held public meetings on the proposed standards as required by the enacting legislation.

The Forum recommended that the individual Basin States adopt the report, *Water Quality Standards for Salinity Including Numeric Criteria and Plan of Implementation for Salinity Control, Colorado River System*. The proposed water quality standard called for maintenance of flow-weighted average total dissolved solids concentrations of 723 mg/L below Hoover Dam, 747 mg/L below Parker Dam, and 879 mg/L at Imperial Dam. Included in the plan of implementation were four salinity control units and possibly additional units, the application of effluent limitations, the use of saline water whenever practicable, and future studies. The standards are to be reviewed at 3-year intervals. All of the Basin States adopted the Forum-recommended standards. The EPA approved the standards.

Numeric criteria for the Lower Colorado River

	Annual flow-weighted concentration (mg/L)
Below Hoover Dam	723
Below Parker Dam	747
At Imperial Dam	879

In recognition of the salinity problem, Congress passed the Colorado River Basin Salinity Control Act of 1974 (Public Law 93-320). Title II of the Act authorized the construction of four salinity control units and the planning of 12 other units (including the Price-San Rafael Rivers Unit) as part of the basinwide salinity control plan. The Price and San Rafael Rivers were authorized for feasibility study by the Act. Public Law 98-569 amended the

Salinity Control Act, and, among other things, authorized the USDA onfarm program. Public Law 98-569 also directed that units will be given preference which reduce salinity at the least cost per unit of salinity reduction (cost effectiveness).

Studies for the Unit found that of the project area's annual estimated contribution of 430,000 tons of salt, more than half (244,000 tons) is attributable to present irrigation practices as they contribute to ground-water salinity. Of this amount, about 70 percent is attributable to the dissolution of salts from the soil and subsurface materials by deep percolating irrigation water, while 28 percent is attributable to canal seepage, and 2 percent to stock pond seepage.

Much of the salt pickup in both rivers' basins is from the dissolution of salts from the soil and subsurface materials, principally from soils formed on and from marine shales, including the Mancos shale formation, that underlie much of the area. Deep percolation from irrigation dissolves salts from the soils and shales and conveys them to natural drainages and ultimately the Green and Colorado Rivers.

Approximately 92,270 acre-feet of water annually enters the ground-water system in the area. Outflow from the ground-water system consists of consumptive use by phreatophyte wetlands and crops in the area and ground-water return flows to the rivers. Inflows to the project area ground-water system carried about 56,880 tons of salt, while outflows carried approximately 300,880 tons.

Watersheds of the Price and San Rafael Rivers drain into the Colorado River via the Green River. The Price River flows southeast from headwaters in the Wasatch and Tavaputs Plateaus, and the San Rafael River flows east from headwaters in the Wasatch Plateau.

Within the Price and San Rafael basins, altitude ranges from approximately 4,000 to 10,000 feet above sea level, and vegetation varies accordingly. Most of the project area occurs between 5,500 and 6,000 feet in elevation in the salt-desert shrub zone. This zone receives less than 10 inches of annual precipitation and is dominated by communities of native plants associated with salt-bearing soils—shadscale, varieties of saltbush, winterfat, and black greasewood.

EXISTING ENVIRONMENT

Major communities in the sparsely populated farming and coal mining area include the largest, Price, population 8,712, in Carbon County; Castle Dale, about 32 miles south of Price in Emery County, population 1,704; and the smaller communities of Huntington, Ferron, Orangeville, and others. Project area population in 1990 was 30,560 according to the Federal census. Major State and Federal highways traverse the area, and Price is served by a small airport and the Denver and Rio Grande Western Railroad which runs from Salt Lake City to Denver.

Of approximately 2.8 million acres within the unit area, about one-fifth is private land, while more than two-thirds is national forest or national resource land. National forest and national resource lands are used for livestock grazing along with non-Federal rangeland. Of the private land totaling about 585,000 acres, 66,450 acres are irrigated crop or pasture lands, largely planted in feed crops for cattle and sheep.

Although there are appropriated water rights to irrigate approximately 66,450 acres, water is not available to serve that amount of acreage in 8 of 10 years; about two-thirds of eligible acreage is irrigated in an average year. Most of the irrigated lands are located along State Route 10 from Price to Ferron in a strip roughly 10 miles wide.

Nonirrigated lands have been used primarily for grazing. Average size of the 210 farms in Carbon County is 1,605 acres, with 50 to 60 acres irrigated, while in Emery County the 446 farms average 484 acres, with an average of 90 to 100 acres irrigated.

An estimated 11,000 acres of wetland occur within the San Rafael River drainage, and 8,000 acres within the Price River drainage; an additional 3,400 acres of wetlands occur along the San Rafael River and 2,850 acres along the Price River, for a total of 25,250 acres. Of these, onfarm wetlands are estimated to occupy some 15,000 acres. Other wetlands include approximately 2,740 acres along Cottonwood, Ferron, Huntington, and Rock Canyon Creeks.

One major wetland type in the area—the palustrine persistent emergent (sedges, brushes, and grasses)—is largely manmade, existing because of current irrigation practices or as stock ponds created by constructing low dams across small drainages. Other major wetlands within the project area exist along rivers, streams, and larger canals and drains, supporting plant communities commonly referred to as riparian communities of cottonwoods, willows, Russian olive, tamarisk, and black greasewood.

The concept of improving irrigation efficiency to reduce salinity in the Colorado River was, accordingly, balanced against the environmental consideration of protecting irrigation-induced wetland, riparian vegetation, and aquatic habitat. It was recognized that full wildlife habitat replacement in-kind and in-place could result in significant seepage and salt loading. SCS and Reclamation consulted separately with the Fish and Wildlife Service (Service) on wildlife mitigation and habitat replacement. Reclamation's off-farm mitigation plan is directed toward providing in-kind habitat replacement, while the USDA relies on voluntary onfarm habitat replacement by individual landowners through agency provision of technical assistance and cost-share funds.

Animals, characteristic of life zones ranging from high mountain forest to salt-desert shrubland, are found in the project area, including approximately 90 species of mammals, 270 species of birds, 26 species of reptiles, and 9 species of amphibians. Mule deer are the principal big game mammals in the project area, although herds of pronghorn also exist, primarily in the rangeland

south and east of Price. Upland game in the area include ring-necked pheasant, California quail, mourning doves, and cottontails. The State-operated 2,621-acre Desert Lake Waterfowl Management Area south of Price provides habitat for waterfowl, shorebirds, raptors, and other wildlife species. Other waterfowl habitat in the project area is located near Huntington; an area northeast of Desert Lake; and in scattered wetlands, stock ponds, and agricultural lands. A variety of nongame species also exist in the project area.

Sport fisheries are primarily above the project area, including those in the headwaters of the Price and San Rafael Rivers, which support populations of cutthroat, rainbow, brook, and brown trout. Scofield Reservoir on the Price River, one of Utah's few class I fisheries, is managed for rainbow and cutthroat trout, and trout fisheries exist in other waterways and reservoirs including Joes Valley Reservoir. Large-river endangered fishes native to the upper Colorado River System are not found within the project area.

PUBLIC INVOLVEMENT

Both Reclamation and the SCS elicited local participation in planning for the Unit and in selecting recommended alternative methods for salinity reduction. A notice of initiation of investigation was mailed to Federal, State, and local agencies, interest groups, and individuals January 15, 1981. A notice of intent to prepare an environmental impact statement was published in the *Federal Register*. In addition, public input was obtained through meetings, mailings, project area tours, and other contact with local residents, irrigation companies, industries, and local and State officials.

ALTERNATIVES

During the course of the study, a wide range of possible methods for reducing salt loading from the area was investigated. The possible methods included improved surface irrigation, retirement of land from irrigation, selective withdrawal of farmlands, or drainwater for powerplant cooling, industrial use, treatment, or disposal. Application of the four tests of viability, however, resulted in the identification of two plans—sprinkler-only irrigation, and a combination of sprinkler and surface irrigation, with the latter providing greater salinity reduction than the sprinkler-only alternative at a lower cost per ton of salt than the majority of other units implemented under the Salinity Control Act. Both viable alternatives also provided for lateral improvements and removal of winter livestock water.

Formulation of alternatives took into account the fact that, in an average year, there is not enough water to adequately irrigate all the land that has a water right. When an average water supply is available, only about 70 percent of the land with water rights will be irrigated. Some of this 70 percent presently

receives only part of what is considered a full water supply. The combination of sprinkler and improved surface irrigation will provide a full water supply to more acres by improving the efficiency of water use.

Features and accomplishments of the preferred plan—the Resource Protection (RP) Plan—are described below and are shown in an accompanying table, along with those of the sprinkler-only, or National Economic Development (NED) and no action alternatives.

RESOURCE PROTECTION PLAN

The preferred plan would include the installation of sprinkler irrigation systems, improved surface irrigation and irrigation water management, and the elimination of water from all open conveyance systems in the project area during the winter (nonirrigation) season, as noted earlier.

Sprinkler irrigation systems improvements would involve, but would not be limited to, diversion works from main canal systems, onfarm buried pipes, pumps, motors, sprinkler systems, and off-farm buried pipe laterals that would provide gravity pressure to the onfarm system. A significant participation rate for each lateral would be required before Reclamation and SCS would initiate the design of piped laterals.

The improved surface irrigation system would include such facilities and treatments as water measuring devices, water control structures, land leveling, pipelines, gated pipe, borders, automated water control valves, and tail water recovery systems. Methods could include furrow, corrugation, contour, or border irrigation.

Irrigation water management would be required for both alternatives. Technical and cost-sharing assistance would be provided to individual water users, irrigation companies, and groups to install needed system improvements. Technical assistance would include working with irrigation companies to improve management of irrigation water delivery and, in some cases, assisting them in converting from a fixed-schedule delivery to demand delivery of irrigation water. Individual assistance would be provided to each water user to evaluate and modify present irrigation methods and other management practices to achieve improved irrigation efficiencies and resource management skills.

A total of approximately 156 miles of open, unlined waterways, primarily laterals, are projected to be eliminated under the preferred plan.

The elimination of winter water would be accomplished by expanding domestic systems to replace 213 existing stockwater ponds, lining 83 stock ponds, and constructing a 10.6-mile pipeline to deliver raw water to underutilized

stockwater lines and to the Orangeville and Castle Dale water treatment plants. This line would replace use of the Mammoth Canal in winter to provide the raw water to the treatment plants.

Environmental measures would include 330 acres of wetland replacement for off-farm losses and rehabilitation of 457 acres of upland habitat; onfarm replacement of wildlife losses would be on a voluntary basis, but \$10.91 per acre-foot would be paid to the Endangered Species Recovery Implementation Plan for depletions from the Colorado River. The Utah Division of Wildlife Resources (UDWR) would administer the Reclamation-established wildlife habitat mitigation area.

The United States would execute contracts with affected canal companies for the administration of project facilities. These canal companies would continue to operate and maintain their own distribution facilities, including the piped lateral systems and farm ponds. The companies would contract with the water users for the water sales and for operational arrangements affecting each water user.

USDA will execute salinity control plans and long-time contracts with individual landowners to assure installation and maintenance of planned systems and efficient management of irrigation water.

The construction cost of the preferred plan is estimated at \$77,710,870, based on 1989 prices. This amount includes cost components of the onfarm and off-farm plan for Reclamation, the USDA, and individual farmers; it includes mitigation and habitat replacement costs to compensate for the loss of land and habitat for wildlife because of the project and for depletion of flows to the Colorado River by onfarm actions.

A monitoring and evaluation plan for the Unit would be developed by both Reclamation and SCS in consultation with other agencies to measure salinity changes in the river system and in inflow and outflow from selected agricultural fields. Other monitoring would include wetland/wildlife habitat quality and quantity, and economic impacts from individual USDA-administered salinity control plans.

Cost allocation and repayment follow the mandates of Public Law 93-320, as amended by Public Law 98-569, by providing that 30 percent of the costs of operation, maintenance, and replacement (OM&R) and the off-farm portion, including wildlife mitigation, would be reimbursed as follows:

- The Upper Colorado River Basin Fund's portion of construction and replacement would be repaid with interest within 50 years or less if the life of the facilities is shorter than 50 years.

Summary comparison of viable plans and the no action alternative

	Present level condition	No action condition	RP plan	NED plan
Salinity control				
Project area salt contribution (tons)	263,500	244,000	82,960	96,410
Salt removed annually (tons)	0	9,500	161,000	147,600
Onfarm improvements				
Gravity sprinkler (acres)	1,140	1,140	16,350	16,350
Pressure sprinkler (acres)	200	200	9,650	9,650
Onfarm surface improvements (acres)	0	0	10,050	0
Total irrigated land (acres)	48,910	45,280	45,280	45,280
Off-farm improvements				
Canal and laterals eliminated (miles)	0	0	156	156
Off-farm delivery placed in pipe (miles)	0	0	97	97
Price River Water Improvement District culinary connections (each)	0	0	50	50
North Emery Water Users Association culinary connections (each)	0	0	163	163
Stock ponds lined (each)	0	0	83	83
Cottonwood Creek municipal and industrial pipeline (miles)	0	0	11	11
Impacts				
Wetlands/riparian (acres)	27,990	27,490	21,900	22,308
Mitigation off-farm (acres)	0	0	330	330
Areas converted to upland (acres)	0	500	5,590	5,182
Colorado River depletion (acre-feet)	0	2,000	25,310	22,410

- The Lower Colorado River Basin Fund's portion of construction and replacement would be repaid either without interest during the year costs are incurred or, if the fund is unable to repay during the year the costs are incurred, with interest as soon as monies are available.

For the off-farm irrigation improvement plan, Upper Colorado River Basin funds would reimburse \$118,698 annually, based on a fiscal year 1990 repayment rate of 8-1/8 percent interest and a 50-year repayment period under the Colorado River Basin Salinity Control Act. Annual reimbursement from the Lower Colorado River Basin funds would be \$672,621 including interest. For the winter water plan, the Upper Basin would reimburse \$20,583 annually and the Lower Basin fund \$116,634 annually, both including interest.

Thirty percent of construction costs for the onfarm portion and all OM&R will be paid by landowners.

FUTURE-WITHOUT-PLAN CONDITION (NO ACTION ALTERNATIVE)

The no action alternative is discussed in the document to identify future conditions in the Price-San Rafael Rivers area without either of the viable plans or other salinity control measures by USDA or Reclamation. The no action alternative provides a baseline for determining the effects of the viable plans.

The primary difference between the estimated no action and current conditions in the project area is the result of water rights owned by Utah Power and Light Company (UP&L). UP&L on an average year owns 48,400 acre-feet of water, and at present is using about 35,000 acre-feet for cooling. Each year UP&L leases back to the irrigators about 13,400 acre-feet. If, in the future, UP&L constructs other power units, or if because of drought the company needs to use all of its water rights, there would not be water to lease to area landowners. Full exercise of UP&L water rights would cause an additional 3,630 acres of farmland to be retired from irrigation. This reduced acreage is used as the baseline for this study.

Under no action conditions, onfarm irrigation efficiency is projected to improve slightly, with little or no change in the types of crops grown. Land retirement and related irrigation/salinity reductions are not expected to occur in the project area.

BASIS FOR PLAN SELECTION

The preferred plan was selected from the viable alternatives based on cost effectiveness, salt-load reduction, reasonable expectations for cost sharing or future development, and environmental considerations.

Public Law 93-320, as amended, directs that plans will be evaluated using cost effectiveness. Under the criterion of cost effectiveness, those plans which would result in reduction of salinity in the Colorado River System at the least cost per ton would be given preference for implementation. The cost-effectiveness criterion used by Reclamation to evaluate and compare salinity measures is based on total annual costs and the resulting average annual salt-load reduction, expressed in dollars per ton.

Both the criteria of cost effectiveness and maximizing salinity reduction were used to select Reclamation's preferred off-farm plan components, rather than only maximizing NED benefits. For plan comparison purposes in the report, the NED proposals of both Reclamation and SCS were described.

The preferred plan in this document includes Reclamation's NED component—off-farm irrigation systems and winter water improvement—coupled with SCS' NED component, unchanged except for the addition of 10,050 acres designated for improved surface irrigation management. The onfarm and off-farm irrigation improvement NED components are interdependent in terms of economic and efficient operation.

ENVIRONMENTAL CONSEQUENCES

A primary environmental effect of implementing the preferred plan would be its contribution to maintaining acceptable salinity concentrations in the Colorado River. The proposed project would reduce the annual salt load to the Colorado River by 161,000 tons. Although total diversions would remain at the present 178,100 acre-feet per year, the amount of water delivered to farms would increase by 5,930 acre-feet. Project-induced changes in deep percolation would result in net water depletions from the Colorado River.

Construction of the off-farm component activities and facilities associated with full implementation of the proposed project would temporarily disturb 457 acres of upland salt-desert shrub, and alter or eliminate 8,330 acres of irrigation-dependent wetlands. Uplands would be rehabilitated through recontouring and seeding of native species. Reclamation would develop 330 acres of wetlands for eventual transfer to the UDWR for management. This development would replace in-kind total wetland losses projected for off-farm construction activities. Replacement of wildlife habitat lost to onfarm activities would be on a voluntary basis by individual landowners. Of onfarm changes impacting irrigation-induced wetlands (5,260 acres), 77 percent occur in agricultural fields. Of these wetlands, 97 percent are pasture/hayland or grass/sedge that are routinely disturbed by mowing and grazing. Impacts to area wildlife would be directly related to alterations in their habitats. Any recreational hunting lost on private lands through habitat alterations as a result of the off-farm system should be replaced by wildlife management areas.

Fisheries resources within the overall project area are limited. The project should improve water quality for aquatic species found in area streams. The proposed project would alter local streamflows; the greatest change would be in high-flow periods, with minor changes during low flows. There would be no significant impact to trout populations or warm-water fisheries.

Two federally listed threatened and eight endangered species may inhabit the proposed project area or be impacted by activities that occur within the area. No terrestrial-listed plants or animals would be impacted, and the Service concurs with this assessment. The proposed project would deplete annual flows to the Colorado River by 25,310 acre-feet. The Service also concurs with Reclamation's assessment that the proposed depletions may affect Colorado River native endangered fishes, but has determined that any depletion of water in the Colorado River is not likely to jeopardize the continued existence of the

Summary

Resource Protection Plan data

Project Features

Sprinkler irrigation component	
Canal and lateral miles eliminated	156 miles
Off-farm systems placed in pipe	97 miles
Onfarm systems improved	36,050 acres
Winter water replacement component	
Culinary connections	
Price River Water Improvement District	50 connections
North Emery Water Users Association	163 connections
Stockwater ponds lined	
San Rafael basin	12 ponds
Price basin	71 ponds
Cottonwood Creek pipeline developed	10.6 miles

Estimated Costs (Preferred Plan)

Construction costs (1989 prices in dollars)¹

Off-farm pipeline systems	
Carbon system	\$ 8,212,400
Huntington-Cleveland systems	\$ 5,405,800
Cottonwood system	\$ 5,600,000
Ferron system	\$ 6,745,300
Price-Wellington system	\$ 3,542,400
Moore system	\$ 677,400
Onfarm irrigation system (70-percent Federal cost share)	
Carbon system	\$10,502,110
Huntington-Cleveland systems	\$10,612,280
Cottonwood system	\$ 7,434,440
Ferron system	\$ 7,291,050
Price-Wellington system	\$ 4,885,358
Moore system	\$ 1,563,331
Culinary system - capital cost	
Price River Water Improvement District	\$ 197,000
North Emery Water Users Association	\$ 846,000
Stockwater ponds	
Cottonwood Creek pipeline	\$ 1,915,000
	\$ <u>2,221,000</u>
Total	\$77,710,820

¹ Does not include planning costs.

Summary

Colorado squawfish, humpback chub, or bonytail chub, and razorback sucker. Reclamation participates in the Recovery Implementation Program (Program) for these fish. A depletion charge will be paid to the Program to cover USDA activity before implementation. No terrestrial-listed plants or animals would be impacted.

Although numerous cultural resource sites occur in the proposed project area, it is unlikely that construction would have significant adverse impacts on these resources.

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CHAPTER I
Introduction

CHAPTER I
INTRODUCTION

This integrated Planning Report/Final Environmental Impact Statement (PR/FEIS) presents an analysis of the planning process and the environmental impacts of the proposed Price-San Rafael Rivers Unit (Unit) of the Colorado River Water Quality Improvement Program (CRWQIP) and the Colorado River Salinity Control Program (CRSC).¹ The document has been jointly prepared by the Bureau of Reclamation (Reclamation) and the Soil Conservation Service (SCS) to address the full range of potential environmental impacts, in compliance with the National Environmental Policy Act (NEPA). The CRWQIP/CRSC programs provide for projects upstream of Imperial Dam (near Yuma, Arizona, on the Arizona-California border) that are necessary to maintain or reduce salinity in the Colorado River. A final environmental statement on the CRWQIP was prepared by Reclamation and SCS (May 19, 1977). This PR/FEIS will be used to meet NEPA compliance requirements and to obtain construction authorization for off-farm features. Onfarm features are authorized for construction under Public Law 93-320, as amended by Public Law 98-569.

The two agencies have distinguishable areas of responsibility in joint planning for the proposed project. Reclamation's off-farm activities focus on the irrigation distribution system, while SCS' planning activities are directed toward onfarm irrigation features. The onfarm and off-farm features are, however, interdependent; some onfarm improvements involve the installation of sprinklers, which, in turn, require pressurization of lateral distribution systems. The outcome of joint planning is to reduce deep percolation and resulting salt loading to the Price and San Rafael Rivers and thereby to diminish salt returning to the Colorado River System.

LOCATION AND SETTING

The proposed Unit comprises the Price and San Rafael Rivers' basins in east-central Utah, approximately 120 miles southeast of Salt Lake City, as shown on the frontispiece location map. The rivers' basins are almost entirely within Carbon and Emery Counties.

The Price and San Rafael Rivers are both major tributaries of the Green River, which, in turn, is tributary to the Colorado River in the Upper Colorado River Basin. The more than 1,400-mile-long Colorado River starts in the Rocky Mountains of Wyoming and Colorado, joins with

¹ As detailed in subsequent sections, both the CRWQIP and CRSC were mandated by Public Law 93-320, Title II of which directs the Secretaries of the Interior and Agriculture to develop salinity reduction measures for the Colorado River System. The CRWQIP is the Department of the Interior's response to that mandate and CRSC is the Department of Agriculture's.

tributaries in Utah, flows through Arizona, Nevada, and California, and terminates in the Gulf of California in the Republic of Mexico.

The Price River flows southeasterly approximately 138 miles to join the Green River 12 miles north of Green River, Utah. The San Rafael River parallels the Price River 25 miles to the south, flowing about 90 miles southeasterly to its confluence with the Green River 15 miles south of Green River, Utah.

Major communities in the sparsely populated farming and coal mining area include the largest, Price, population 8,712, in Carbon County; Castle Dale, about 32 miles south of Price in Emery County, population 1,704; and the smaller communities of Huntington, Ferron, Orangeville, and others. Project area population in 1990 was 30,560 according to the 1990 census.

State Route 10 runs southward from Price to the smaller communities, while State Route 6 connects Price with Green River, Utah, to the southeast. Interstate 70 traverses the southern part of the area. Price is served by a small airport and the Denver and Rio Grande Western Railroad which runs from Salt Lake City to Denver.

Of approximately 2.8 million acres within the Unit area, about one-fifth is private land, while more than two-thirds is national forest or national resource land. Of the private land totaling about 585,000 acres, 66,450 acres are irrigated crop- or pasture-lands, largely planted in feed crops for cattle and sheep. Private and State rangeland and national forest and national resource lands are used for livestock grazing.

Although there are appropriated water rights to irrigate approximately 66,450 acres, water supplies cannot serve that amount of acreage; in an average year only about two-thirds of this eligible acreage is irrigated. Most of the irrigated lands are located along State Route 10 from Price to Ferron in a strip roughly 10 miles wide.

Nonirrigated lands have been used primarily for grazing. Average size of the 210 farms in Carbon County is 1,065 acres, with 50 to 60 acres irrigated, while in Emery County the 446 farms average 484 acres, with an average of 90 to 100 acres irrigated.

PURPOSE, SCOPE, AND OBJECTIVES OF STUDY

The principal objective of the CRWQIP/CRSC is to meet the water quality standards for salinity in the Colorado River adopted by all Basin States while the Upper Basin States continue to develop their compact-apportioned water.²

² The 1922 Colorado River Compact apportioned the waters between the Upper and Lower Basins. The 1948 Upper Colorado River Compact apportioned the waters between the Upper Basin States. Utah's share from the compact was roughly one-fourth, hence the term "compact-apportioned water."

The overall purpose of Price-San Rafael Rivers Unit PR/FEIS as part of the CRWQIP/CRSC is to derive and evaluate alternatives and recommend a method to reduce the estimated total of 430,000 tons of salt per year contributed to the Colorado River System from the two basins in the project area.

The 312,260 acre-feet of surface waters of the Price and San Rafael Rivers are of excellent quality as they enter the irrigated area, displaying a flow-weighted average total dissolved solids (TDS) of less than 300 milligrams per liter (mg/L). As the rivers flow toward the Green River, natural sources, seepage, and deep percolation from irrigation return flows add salts. The flow-weighted average salt concentrations as the rivers leave the basins are about 2,400 mg/L on the Price River and 1,700 mg/L on the San Rafael River.

The project area's total salt contribution is about 5 percent of the salt load (9 million tons) in the Colorado River below Hoover Dam. Of the two basins' annual estimated contribution of 430,000 tons of salt, more than half (244,000 tons) is attributable to irrigation practices as they contribute to ground-water salinity. Of this amount, about 70 percent is attributable to the dissolution of salts from the soil and subsurface materials by deep percolating irrigation water, while 28 percent is attributable to canal seepage, and 2 percent to stock pond seepage.

Ways to accomplish salt-reduction objectives have been derived jointly in studies by Reclamation, which have emphasized ways to minimize off-farm salt contribution, and those of the SCS, which have targeted salt contribution and potential improvements to farmed fields and related upland areas.

Studies included the determination of salt-loading mechanisms, development of alternatives for reducing the salt contribution, identification of potential beneficial uses of saline water, evaluation of alternatives, and selection of a preferred plan.

STUDY AUTHORITY

Although a number of water quality-related legislative actions have been taken on the State and Federal levels, four Federal acts are of special significance to the Colorado River Basin—the Water Quality Act of 1965 and related amendments, the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), the Colorado River Basin Salinity Control Act of 1974 (Act) as amended, and the Clean Water Act of 1977 as amended.

The Water Quality Act of 1965 (Public Law 89-234) amended the Federal Water Pollution Control Act and established a Federal Water Pollution Control Administration (now the Environmental Protection Agency [EPA]). Among other provisions, it required States to adopt water quality criteria for interstate waters inside their boundaries. The seven Basin States initially developed water quality standards that did not include numeric salinity criteria for the Colorado River, primarily because of technical constraints. In 1972, the States

agreed to a policy that called for the maintenance of salinity concentrations in the Lower Colorado River System at or below existing levels, while the Upper Basin States continued to develop their compact-apportioned waters. The States suggested that Reclamation should have primary responsibility for investigating, planning, and implementing the proposed Colorado River Basin Salinity Control Program.

The enactment of the Federal Water Pollution Control Act Amendments of 1972 affected salinity control in that the legislation was interpreted by EPA to require numerical standards for salinity in the Colorado River. In response, the Basin States founded the Colorado River Basin Salinity Control Forum (Forum) to develop water quality standards including numeric salinity criteria and a basinwide plan of implementation for salinity control. The Basin States held public meetings on the proposed standards as required by the enacting legislation.

The Forum recommended that the individual Basin States adopt the report, *Water Quality Standards for Salinity Including Numeric Criteria and Plan of Implementation for Salinity Control, Colorado River System*. The proposed water quality standard called for maintenance of flow-weighted average TDS concentrations of 723 mg/L below Hoover Dam, 747 mg/L below Parker Dam, and 879 mg/L at Imperial Dam. Included in the plan of implementation were four salinity control units and possibly additional units, the application of effluent limitations, the use of saline water whenever practicable, and future studies. The standards are to be reviewed at 3-year intervals. All of the Basin States adopted the Forum-recommended standards. The EPA approved the standards.

In recognition of the salinity problem, Congress passed the Colorado River Basin Salinity Control Act of 1974 (Public Law 93-320). Title II of the Act authorized the construction of four salinity control units and the planning of 12 other units (including the Price-San Rafael Rivers Unit) as part of the basinwide salinity control plan. The Price and San Rafael Rivers were authorized for feasibility study by the Act. Public Law 98-569 amended the Salinity Control Act and, among other things, authorized the United States Department of Agriculture (USDA) onfarm program. Public Law 98-569 also directed that units will be given preference which reduce salinity at the least cost per unit of salinity reduction (cost effectiveness).

A memorandum of agreement between the SCS and Reclamation, effective March 27, 1975, specifies each agency's specific respective activities to implement Title II of the Salinity Control Act, as described in later sections of this document.

ENVIRONMENTAL CONSIDERATIONS

Mitigation and Salinity

The Colorado River Basin Salinity Control Act (Public Law 93-320, as amended), establishes water quality improvement through salt reduction as the main objective, with provision for minimizing adverse impacts. The concept of improving irrigation efficiency to reduce salinity in the Colorado River may be in conflict with the environmental values of protecting irrigation-induced wetlands, riparian vegetation, and aquatic habitats, and maintaining the flow of the Colorado River. At the same time, however, full mitigation in-kind and in-place could diminish salinity benefits to be derived from the project. Such mitigation could retain high salinity flows of the kind that result from the deep percolation of surplus irrigation flows and that, in turn, create riparian and wetland areas at the edge of farm fields, below farm fields, and in irrigation ditches.

Selenium Contribution

Initial studies have shown that the Price River is a significant contributor of selenium to the Green River with a mean concentration of 6.5 micrograms per liter and a mean load of 9.4 kilograms per day at Woodside (data for water years 1988 and 1989) (U.S. Geological Survey, 1992). To date, no information on selenium contribution is available for the San Rafael River.

Concentrations of selenium have been measured in water flowing into Desert Lake Wildlife Management Area (WMA) that exceeded concentrations known to have adverse effects on biota. Fish from Desert Lake locations had moderately high levels of selenium. Five American coot eggs collected from the Tamarisk Lake area of the WMA had a selenium concentration of 9.8 to 16.9 micrograms per gram ($\mu\text{g/g}$) dry weight (Fish and Wildlife Service [Service], 1990). A subsequent study of seven randomly collected eggs from seven individual nests of four different species in this same area of the WMA found concentrations of selenium from 6.8 to 22.6 $\mu\text{g/g}$ (Service, 1992). These concentrations exceed levels associated with reduced reproduction in waterfowl. Some were large enough to cause embryo deformities although no deformities were observed.

Since the underlying Mancos shale formation appears to be the source of selenium for the Price River and for Desert Lake WMA, as well as the source of salt, a decrease of deep percolation return flow to the Price River and the WMA would reduce selenium contribution just as it reduces salt. Therefore, although this information does not necessitate any change in the project, the agencies will continue to monitor the continuing selenium contamination studies.

Flow Depletions

The term "depletion" refers to a reduction of return flow to the river system. The reduction stems from an increase in consumptive use of irrigation water and a resulting decrease in deep percolation. To reduce area salt loading into the Colorado River System, the amount of salt-laden water that is returned to the river due to deep percolation and seepage from irrigation systems and farm ponds must be reduced. Two methods are used to accomplish this—irrigation water management improvements and improvement of the winter livestock water system.

Water rights in the Price-San Rafael area in most years exceed the water supply. In the case of this project, both runoff and deep percolation would be reduced through the salinity program. The reduction would be available to irrigate land areas that are partially irrigated and would be held in reservoirs to be released at a future time when plants reach their peak water use. The net result in either case would be an increase in crop consumptive use and a reduction in return flow to the river.

It was determined that Reclamation and USDA should each provide mitigation/replacement according to its own policy and authorization procedures, and should not combine the mitigation/replacement into one joint package. Because of the Forum's³ input, the two agencies consulted separately with the Service to satisfy requirements of the Fish and Wildlife Coordination Act. Reclamation's off-farm mitigation plan is directed toward providing in-kind, in-place habitat replacement, while the USDA relies on voluntary onfarm habitat replacement by individual landowners through agency provision of technical assistance and cost-share funds.

In this document, the USDA habitat replacement program is often discussed in relation to the existing Uinta Basin Unit (CRSC) which adjoins the Price River basin on the north. With a plan and cost-sharing rate similar to those proposed in this document, the following wildlife habitat improvement practices were installed in the 3-year period 1987-89: about 24 acres of ponds, 32 acres of shelterbelts, 340 acres of grass and legume plantings, and 35,000 feet of fence for protection of wildlife habitat. During this period, about 21,000 acres of irrigated land were treated with improved irrigation systems.

PLANNING CONSIDERATIONS AND CONSTRAINTS

Proposed irrigation improvement components for the Unit were found to be feasible only if jointly developed by both agencies. Technical data

³ The Forum is made up of governors or their representatives from the seven Basin States in the Colorado River's Upper and Lower Basins.

relating to the onfarm aspects of the plans were developed and reviewed by SCS; comparable data for off-farm features were developed and reviewed by Reclamation.

When planning was initiated by SCS personnel, preliminary designs were drawn. Based on these designs and conversations with local landowners, it was estimated that about 60 percent of the land would be changed to sprinkler irrigation systems under cost sharing available with the salinity control program. Owners of another 20 percent of the land indicated they would not be willing to install sprinkler systems but would be willing to improve their surface irrigation systems. The balance of the land either already has improved systems or is owned by landowners who, it is assumed, would not participate.

Experience in the Uinta Basin Unit has been that, over time, as farmers see the success of sprinkler irrigation in their area, a larger percentage chooses to convert to sprinklers. However, because the program is voluntary and no commitment is made by the landowner prior to the time the cost share is available, no better estimate is available.

Accordingly, costs of the off-farm laterals were computed for a system which would serve 100 percent of the project area but are factored by 60 percent, considered the most likely number to install sprinkler systems. Since soils within the irrigated areas are uniformly saline, impacts of participation by farms within each river basin would be similar. The two agencies' financial and economic analyses are presented separately in chapter IV.

When considering canal lining as a salinity reduction measure, Reclamation noted that the area's Mancos Formation often does not perform well as a foundation material, particularly for rigid structures, linings, and pavements. Because of the expansive and varied nature of the formation, differential settlement and heaving often occur, causing minor to serious damage. Several concrete-lined canals and ditches constructed in Mancos shale were inspected in the area. These linings were generally in fair to poor condition. Many sections were badly cracked, and the sides and bottom of the canal had heaved. In addition, there were evidences in some areas of moderate to severe cement/soil reaction. If lining of any sections were to be required, pipe is believed to have the best performance and longevity.

For planning purposes, subunits were designated within the project area to simplify data collection and the development of alternatives, as shown on accompanying figure I-1. However, land eligible for participation is not limited to land within the identified subunits.⁴

Finally, State water laws and practices have influenced the planning process. Utah considers instream dilution as a beneficial use of its waters only if waters

⁴ In addition, there are an estimated 1,500 irrigated acres located outside the subunits in areas such as the Stowell Irrigation Company. These lands are widely dispersed.

are held by the Division of Wildlife Resources; therefore, any fresh water made available by a salinity control project remains available for other water users who have State water rights.

Reclamation—Mitigation

Reclamation's fish and wildlife plan is to provide full in-kind mitigation, if possible. The plan, described in chapter IV, would provide for development of about 330 acres of wetland and riparian habitat within the Unit at a cost of approximately \$3,200 per acre and rehabilitation of upland sites at additional costs. Since the habitat plan would include incrementally implemented acreages, it could accommodate phased participation in a lateral system.

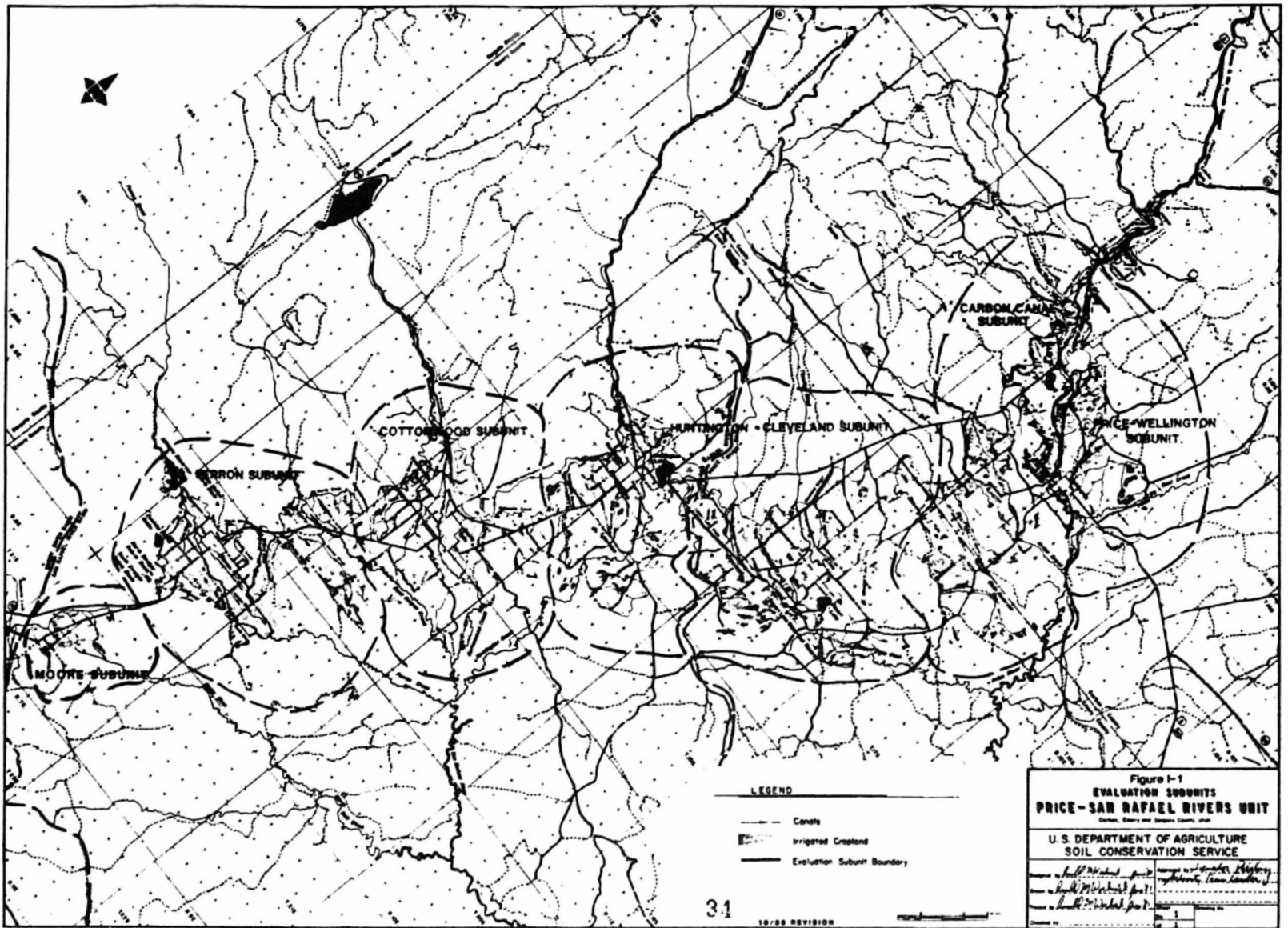
U.S. Department of Agriculture—Habitat Replacement

The entire USDA onfarm program, including associated wildlife habitat replacement plans, is voluntary and would require financial participation by farmers, according to the existing CRSC program. Under amendments to the Colorado River Basin Salinity Control Act, the USDA is authorized to provide technical assistance for the voluntary replacement of fish and wildlife habitat values foregone. The maintenance of existing fish and wildlife values would be encouraged; however, this would be a decision of the landowner/user. USDA has estimated wildlife replacement based on experience in similar areas.

Under this program, the SCS develops Salinity Control Plans (SCP) with participants and provides technical assistance to implement the plans. The Agricultural Stabilization and Conservation Service provides cost-share funds to eligible landowners to implement the SCP's. Cost share for replacement of fish and wildlife habitat would be at the same rate as irrigation practices. The principal implementation objective of the SCP's would be to improve onfarm irrigation efficiencies, reducing the deep percolation of irrigation water. This may reduce riparian/wetland vegetation and habitat which is dependent on deep percolation. Accordingly, to comply with NEPA, when providing technical assistance in SCP development, the SCS would initiate a site-specific Environmental Evaluation (EE) to identify impacts to the resource base. The EE would be used to develop alternative measures for presentation to landowners that would maximize salinity program benefits and provide for voluntary replacement of wildlife habitat values foregone.

PUBLIC INVOLVEMENT/SCOPING

Both Reclamation and SCS elicited local participation in planning for the Unit and in selecting recommended alternative methods for salinity reduction.



A notice of initiation of investigation was mailed to Federal, State, and local agencies, environmental organizations, interest groups, and individuals January 15, 1981.

Ways in which public input was ensured included meetings, newsletters, project area tours, correspondence, and personal contact with local residents, irrigation companies, industries, and local and State officials.

PREVIOUS STUDIES IN THE PROJECT AREA

Before initiating joint studies, Reclamation and SCS each conducted separate studies for the Price-San Rafael area. Reclamation's studies focused primarily on off-farm measures, while SCS targeted onfarm improvements. These studies are discussed below.

Reclamation initiated studies on the Price and San Rafael Rivers in the late 1970's with a data collection program of water quality samples and streamflow measurements. SCS investigations were begun in 1978 and have continued to the present time. In 1981, Reclamation contracted studies to CH₂M-Hill, a private firm, which conducted an extensive stream- and ground-water monitoring program and evaluated options for salinity reduction in the project area. Subsequent reports by the firm include:

1. *Problem Identification and Quantification* (March 1982)
2. *Identification of Alternative Plans* (March 1982)
3. *Plan of Study for Verification Activities* (June 1982)
4. *Verification Activities Report, Salinity Investigations of the Price-San Rafael Rivers Unit, CRWQIP* (September 1983)
5. *Appraisal Level Designs and Cost Estimates Report* (October 1983)
6. *Phase I Report* (July 1984)

CH₂M-Hill found irrigation deep percolation and canal seepage to be the major salt contributors and subsequently recommended lining canals, lining stock ponds, and eliminating conveyance of winter water in canals to reduce salinity.

In 1984, Reclamation prepared a plan formulation working document (PFWD) that incorporated CH₂M-Hill's findings and focused on canal lining and winter water systems improvement as salt-reducing techniques. The PFWD and preferred plan were approved by Reclamation officials, but reformulation was undertaken when canal ponding tests indicated that canal lining would not produce the anticipated benefits. The recommended Reclamation plan was

reduced to only the winter water systems improvement plan, which would have reduced salt loading by about 22,000 tons. Soon after, joint studies with SCS were encouraged by the Forum.⁵

In addition, the U.S. Geological Survey operates gauging stations in the project area along the Price and San Rafael Rivers and on the principal tributaries. These stations are used for measuring continuous streamflows and/or measuring TDS by electrical conductivity. Separate elements of the overall salinity problem have been studied or contracted for study by other entities including Utah State University, the State of Utah, the Bureau of Land Management, and the Southeastern Utah Association of Governments.

Joint Reclamation/SCS Studies

A 1986 joint appraisal-level report by Reclamation and SCS proposed a gravity sprinkler irrigation system for the Ferron and Cottonwood Creek areas. Under this and a 1987 follow-up plan, essentially as described in this report, off-farm conveyance facilities, primarily pressurized pipelines, would be constructed by Reclamation, while onfarm improvements would be planned and designed by SCS and constructed by local beneficiaries. Winter water delivery in project area canals and laterals would be discontinued, and Reclamation would line some stockwater ponds, to which water would be delivered by pipeline. Program implementation would have reduced salt-loading by an estimated 52,300 tons at an average cost of \$70 per ton.

In late 1988, Reclamation developed a computerized water- and salt-budget accounting system to determine salt-load reduction and Colorado River depletions resulting from onfarm as well as off-farm improvements in Mancos shale-derived soils. The system aids in analyzing the future-without-project condition and the combined Reclamation and SCS plans using data from both agencies; this, in turn, helps to reconcile salinity estimates compiled by the two agencies under combined Reclamation/SCS planning. Data provided for the water-salt budget by Reclamation relate to delivery system seepage and improvements for both irrigation season and winter water deliveries and phreatophyte use related to the delivery system. SCS data relate to onfarm operations and improvements.

⁵ The Forum is composed of up to three water resource and/or water quality representatives from each of the seven Colorado River Basin States appointed by their respective Governors. The Forum was created in 1973 by the States in response to Public Law 92-500 to develop water quality standards through interstate cooperation.

A major assumption of analysis is that ground-water outflow quality from the project area will not change with improvements in onfarm and off-farm efficiencies, but rather that outflow tonnage of salt is reduced by diminished outflow volume. This assumption is supported by data from Reclamation's Grand Valley Unit, Colorado (Colorado River Basin Salinity Control Project). Under no action conditions, the total salt pickup from agriculture for both basins is 244,000 tons per year. About 70 percent of this total (171,000 tons) is from deep percolation, 28 percent (68,000 tons) from canal seepage, and 2 percent (5,000 tons) from stock pond seepage.

RELATIONSHIP TO OTHER WATER RESOURCE ACTIVITIES

The Unit plan has been coordinated with the existing Scofield and Emery County Projects, Reclamation developments, and with the Ferron Watershed Project, an SCS project, and Utah Power and Light Company's (UP&L) water development projects.

Scofield Project

In the Price River basin, the Price River Water Users Association has storage rights to about 29,534 acre-feet of water in Scofield Reservoir, the only sizable impoundment on that river. The 74,000-acre-foot reservoir, which is the major Scofield Project feature, provides regulation of Price River flows for supplemental irrigation, while privately built distribution systems deliver the water to project lands. Of approximately 22,600 acre-feet of annual diversion from the reservoir, 97 percent is for irrigation and 3 percent for municipal and industrial (M&I) use, though M&I interests hold 28 percent of the storage rights in the reservoir. The Scofield Project provides for supplemental irrigation of about 26,000 acres of land, flood protection, and water for fish propagation.

Emery County

In the San Rafael River basin, storage facilities have been constructed on the three principal tributary streams—Huntington, Cottonwood, and Ferron Creeks—from which irrigation water is diverted. The Emery County Project irrigates approximately 14,000 acres near the towns of Huntington, Castle Dale, and Orangeville. Major storage is provided by the 62,500-acre-foot Joes Valley Reservoir. Other features are: Swasey Diversion Dam, 10 miles downstream from Joes Valley Dam; and Huntington North Reservoir, which provides offstream storage. The project provides an estimated average of 28,100 acre-feet of water, primarily for supplemental irrigation, and can supply 6,000 acre-feet of M&I water. This also includes the Huntington North Reservoir which has a total capacity of 5,420 acre-feet.

The Emery County Reclamation Project, constructed in 1962, consists of Joes Valley Dam and Reservoir, Huntington North Dam and Reservoir, Swasey Diversion Dam, Cottonwood Creek-Huntington Canal, Huntington North service canal, and other appurtenant features. The project-developed water was to be used for supplemental irrigation in the average annual quantity of 28,100 acre-feet. The source of the water developed is Cottonwood Creek and Huntington drainage. The irrigators had primary rights in these two creeks for irrigation purposes.

UP&L bought shares in the Cottonwood Creek Consolidated Irrigation Company and the Huntington Cleveland Irrigation Company to use for power generation. UP&L also obtained 6,000 acre-feet of project water to be used for power generation. UP&L also has primary water shares in the Ferron Creek watershed.

UP&L built the Huntington plant with two units and began using water to generate power. Later the Hunter plant was built with two generation units. At that time, UP&L obtained another 2,574 acre-feet of project water to firm up a water supply for a third unit at the Hunter plant.

UP&L is now using 8,574 acre-feet of project water for power production at the Huntington and Hunter Powerplants. UP&L also uses its primary water rights in Cottonwood, Huntington, and Ferron Creeks for power production. The use of water for power production by UP&L has effected a decrease in the salt loading to the Colorado River.

The Emery County project was made possible by the stockholders of the Cottonwood Creek Irrigation Company and the Huntington-Cleveland Irrigation Company. By "quit-claiming" that portion of their decreed water rights to the United States, an excess of 40 percent of a limited water supply was set aside for project purposes. The resulting unused capacity in Joes Valley Reservoir and in the reservoirs of Huntington Creek is stored as project water.

Ferron Watershed Project

The principal SCS project activity in the area has been the Ferron Watershed, begun in 1965. Under this project, the following structures were constructed: eight debris basins, a livestock pipeline to replace use of the Ferron Creek for livestock water, and the Mill Site Dam. Three reservoirs in the upper watershed (Duck Fork, Willow Lake, and Ferron Reservoir) were converted from irrigation storage to fisheries. About 10 percent of the Ferron irrigation system was improved (earth ditches converted to pipeline). The upper watershed was treated by the Forest Service to improve vegetative cover.

CHAPTER II
Need for Action

CHAPTER II
NEED FOR ACTION

INTRODUCTION

This chapter defines the current and future needs, problems, and opportunities toward which plan formulation has been directed. National needs include salinity control on the Colorado River and its tributaries, including the Price and San Rafael Rivers. A primary local need is maintenance or improvement of agricultural production. The resources necessary to meet these needs are described in chapter III.

COLORADO RIVER BASIN SALINITY

In the Colorado River Basin, salt pickup from the Price-San Rafael Rivers Unit and other sources has resulted in a deterioration of water quality of the Colorado River over the long term as riverflows have been developed for beneficial use. At its headwaters in the mountains of north-central Colorado, the Colorado River has a salinity concentration of 50 milligrams per liter (mg/L). The concentration progressively increases downstream as a result of water use and salt contributions from a variety of natural and human-caused sources. By the time the water reaches the end of the Colorado River, salinity reaches levels which impair its use.

Water with salinity of 1,000 mg/L or less is generally considered to be satisfactory for irrigating most crops, although concentrations exceeding 500 mg/L can have detrimental effects on salt-sensitive crops, depending on the chemical constituents of the water. On land with good drainage, water with salinity exceeding 1,000 mg/L can be used for crops with high salt tolerances. According to Secondary Drinking Water Standards published by the Environmental Protection Agency (EPA), the salinity of public drinking water should be less than 500 mg/L.

The salinity of the river results from two general causes—salt loading and salt concentration.

Salt loading is the addition of salt to the Colorado River from such sources as eroding saline soil materials, irrigation return flows, and saline springs and wells. The average annual salt load of the river exceeds 9 million tons per year. About 47 percent of the salt load is natural; the balance is human caused.

Salt concentration occurs from water use, which reduces water volume in the river without reducing the total amount of salt it carries. Examples include municipal and industrial (M&I) use, transpiration from crops and natural vegetation, and evaporation. As the water is used and reused several times along the river system, these effects contribute to the increasing salinity concentrations.

The high salt concentration in the Lower Colorado River Basin adversely affects more than 18.5 million people and about 1 million acres of irrigated farmland in the United States. Affected most severely are M&I water users in the Las Vegas, Los Angeles, and San Diego areas and irrigators in the Imperial Valley of southern California and in Arizona, who all experience economic losses.

According to a 1986 study by the Bureau of Reclamation (Reclamation), the estimated economic impact of present levels of salinity is more than \$310 million per year. The losses consist of M&I and agricultural losses. Losses associated with M&I use occur primarily from increased water treatment costs, accelerated pipe corrosion and appliance wear, increased soap and detergent needs, and decreased drinking water palatability. For irrigators, the higher concentrations cause decreased crop yields, altered crop patterns, increased leaching and drainage requirements, and increased management costs. Other unestimated and indirect losses occur in the Upper Colorado River Basin.

The salinity of the Colorado River fluctuates annually with the overall basin water supply. Between 1949 and 1970, the general trend of the concentration at Imperial Dam was upward. Since 1970, however, the concentration has decreased both as a result of Colorado River Storage Project (CRSP) reservoirs filling and as a result of a generally more moist weather pattern increasing the amount of water available to dilute the salts. Recently, with less runoff, salinity has been increasing steadily and is expected to increase further.

To limit the salinity of the Colorado River as provided in Public Law 93-320 and in response to the Federal Water Pollution Control Act and its amendments (Public Law 92-500, 1972), the seven Colorado River Basin States adopted, and the EPA approved, salinity standards at three points on the Lower Colorado River and a plan of implementation¹ to meet those standards. The standards were set to limit the average salinity based on mean water supply to the numeric criteria listed in table II-1. The standards acknowledged that variations in hydrology would cause salinity to vary above and below these criteria levels, but the goal of the salinity control program is to meet the agreed upon water quality standards for salinity concentrations at or below these criteria.

Water use within the Colorado River Basin is projected to increase from 10.5 million acre-feet per year in 1987 to 12.8 million acre-feet by 2010. With full development of the compact-apportioned waters, the depletions could increase to more than 15 million acre-feet annually. Annual salinity concentrations at Imperial Dam are estimated to increase from the 1987 measured average level of 850 mg/L to an average of 970 mg/L by 2010 unless additional control measures are implemented to prevent the salinity increase. Table II-2 shows expected salinity levels in the year 2010 with and without additional salinity control measures.

¹ 1990 Review Water Quality Standards for Salinity, Colorado River System, May 1990 prepared by the Colorado River Basin Salinity Control Forum.

Table II-1.—Numeric criteria for lower Colorado River

	Annual flow weighted concentration (mg/L)
Below Hoover Dam	723
Below Parker Dam	747
At Imperial Dam	879

Table II-2.—Flow-weighted annual average salinity at Imperial Dam (unit—mg/L)

	1987	2010
Without additional salinity control measures	850	970
With full implementation of authorized salinity control measures	850	879
Numeric criterion at Imperial Dam	879	879

¹ Average salinity at 2010 level of development.

To attain the adopted salinity criteria, additional salinity control, water augmentation, or management steps will be necessary. Thus, beneficial use, weather modification, vegetation management, watershed improvements, and possibly other measures remain to be considered and studied in detail.

PRICE-SAN RAFAEL RIVERS BASINS SALT LOADING

Water quality is excellent in the Price and San Rafael Rivers before they enter the irrigated portion of the project area on their course toward the Green River. The Price River has its headwaters on the Wasatch and Tavaputs Plateaus to the west and north and flows southeast to its confluence with the Green River approximately 12 miles north of the town of Green River. The San Rafael River is formed by the confluence near Castle Dale of Huntington, Cottonwood, and Ferron Creeks, all of which originate on the Wasatch Plateau to the west. The river then flows east, cutting through the San Rafael Swell, and joins the Green River approximately 15 miles south of the town of Green River. Essentially all

the diversion and use of Price River water occurs upstream from the river's intersection with State Highway 50, while most diversion and use of San Rafael River water occurs from the three tributary streams above their confluence.

The ground-water outflow total dissolved solids (TDS) from the agricultural area range from 3,290 mg/L on the San Rafael River to about 5,250 mg/L on the Price River. Of total ground-water outflow from the agricultural area annually, 70 percent is attributed to onfarm irrigation, with lesser amounts (28 and 2 percent, respectively) from canal and stock pond seepage.

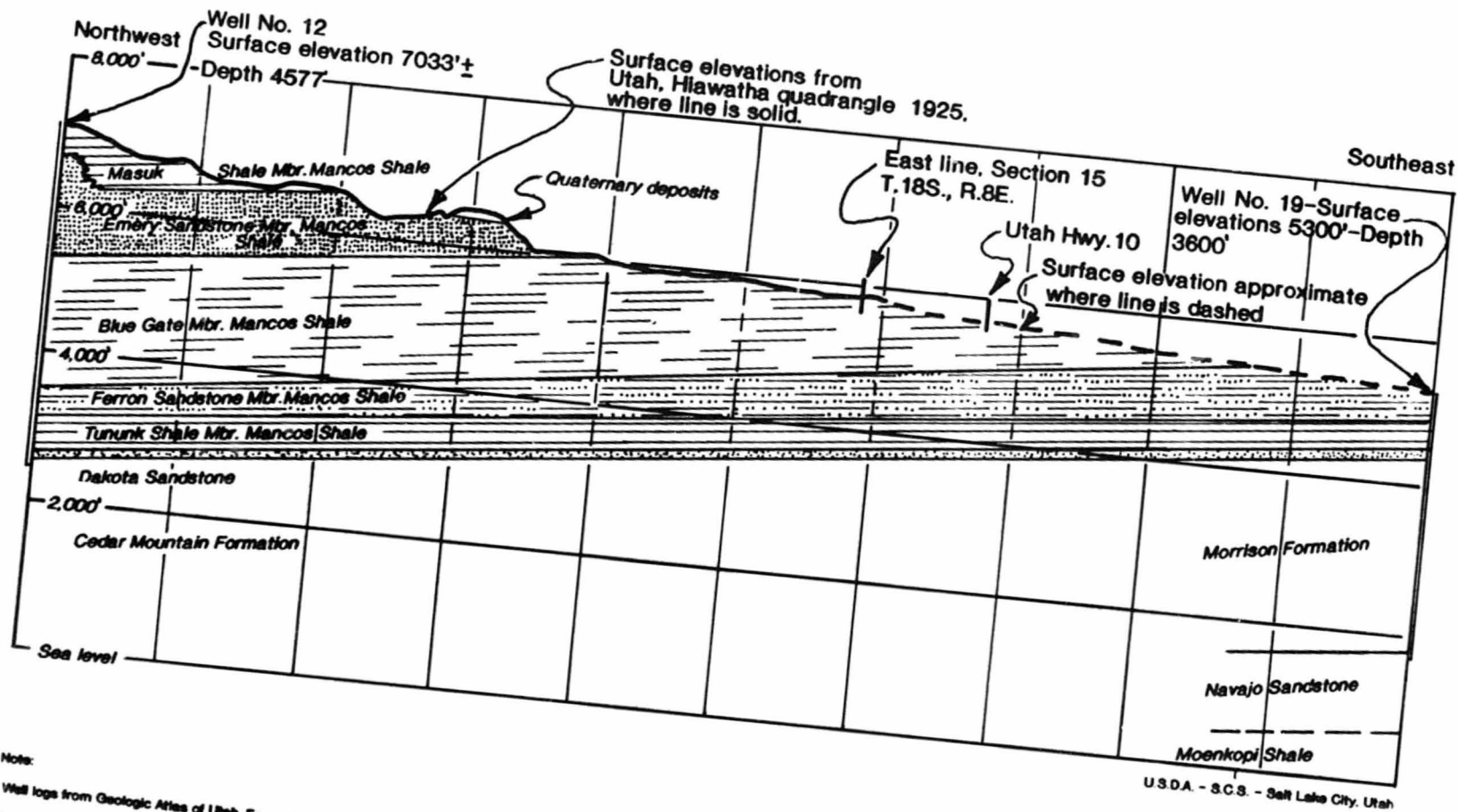
Water in the Price and San Rafael Rivers suffers major deterioration in quality as the streams cross the irrigated sectors of the river basins. The deterioration results from both geologic and human factors. During the period from about November through April, little water is released from the upstream reservoirs, and the upper portion of the basins contribute little water to the rivers. During these periods, irrigation return flow is not significantly diluted by better quality water. Although major releases are made from the reservoirs from May to October, during this period a large part of the flow is diverted into major irrigation canals in the upstream part of the basins. Significant amounts of irrigation return flow of poor quality enter the rivers downstream from points at which most of the flow is diverted from the river.

Accordingly, during most of the year, the flow in the Price River in the central basin and the San Rafael River at the junction of the three major tributary streams is composed of relatively small amounts of water of good quality from the upper basin, and variable amounts of irrigation return flow and natural flow from tributaries that drain the marine shales. This increases the TDS level from about 300 mg/L to about 2,000 mg/L as measured above and below the areas of principal use. Although some deterioration in the chemical quality of the Price River probably would occur in the absence of stream regulation and irrigated agriculture in the central basin, deterioration is intensified with the presence of both.

Much of the salt pickup in both rivers' basins is from the dissolution of salts from the soil and subsurface materials, principally from soils formed on and from marine shales, including the Mancos shale formation that underlies much of the project area, as depicted in figures II-1 and II-2 (figure II-1 is a detail of section A-A in figure II-2). Movement of irrigation water within the soil and deep percolation dissolve salts from the soils and shales, conveying them to natural drainages and ultimately to the Green and Colorado Rivers.

The dominant salt types represented in the basin are carbonates and sulfates associated with calcium, although relatively minor amounts of some sodium salts also occur.

The soils of the two river basins are of different parent materials and have different character. Therefore, soil types, infiltration rates, and salinity yield potential of the two drainages have been separately described. Within each drainage, soil types are consistent and represent consistent soil infiltration



Note:
Well logs from Geologic Atlas of Utah, Emery County
by William Lee Stokes and Robert E. Cohenour, 1956

Figure II-1.

GEOLOGIC SECTION

Chapter II—Need for Action

rates and salinity yield potential. This internal consistency is a reflection of the bedrock, geomorphology, geology, and therefore, limited soil types for each area. The San Rafael area soils are derived from a north-northeast to south-southwest outcropping of weathered Mancos shale, a dark gray, saline clayey shale. The Price River basin soils are derived from weathered Mancos shale alluvium mixed with coarse alluvium derived from overlying sandstones of the area. These soils also have high salinity. A general soil character was developed for each area to describe the soil conditions.

Approximately 92,270 acre-feet of water annually enters the ground-water system in the subunits selected as representative of high salt contributing lands. Ground-water inflow consists of onfarm deep percolation, seepage from the delivery system, as shown in table II-3, and winter water conveyance systems. Outflow from the ground-water system consists of consumptive use by phreatophytes and crops in the area and ground-water return flows to the rivers. Inflows to the project area ground-water system carried about 56,880 total tons of salt, while outflows carried about 300,880 tons, a salt pickup of 244,000 tons.

Table II-3.—Canal lengths and estimated present-day seepage volumes

	Miles	Present average annual canal seepage ¹ (acre-feet)		Total
		Summer	Winter	
Price River basin				
Main canals	84.8	9,600	3,200	12,800
Lateral canals	97.2	1,300	0	1,300
Total basin	182.0	10,900	3,200	14,100
San Rafael River basin				
Main canals	110.9	10,120	3,800	13,920
Lateral canals	103.9	1,080	0	1,080
Total basin	214.8	11,200	3,800	15,000
Both basins				
	396.8	22,100	7,000	29,100

¹ More than 80 percent of the present winter seepage from canals and stock ponds is occurring in the Carbon, Huntington-Cleveland, and Cottonwood Creek areas.

EXISTING IRRIGATION SYSTEMS AND PRACTICES

In order to grow crops, settlers in the project area in the late 1800's diverted waters of the Price and San Rafael Rivers. Natural flows from

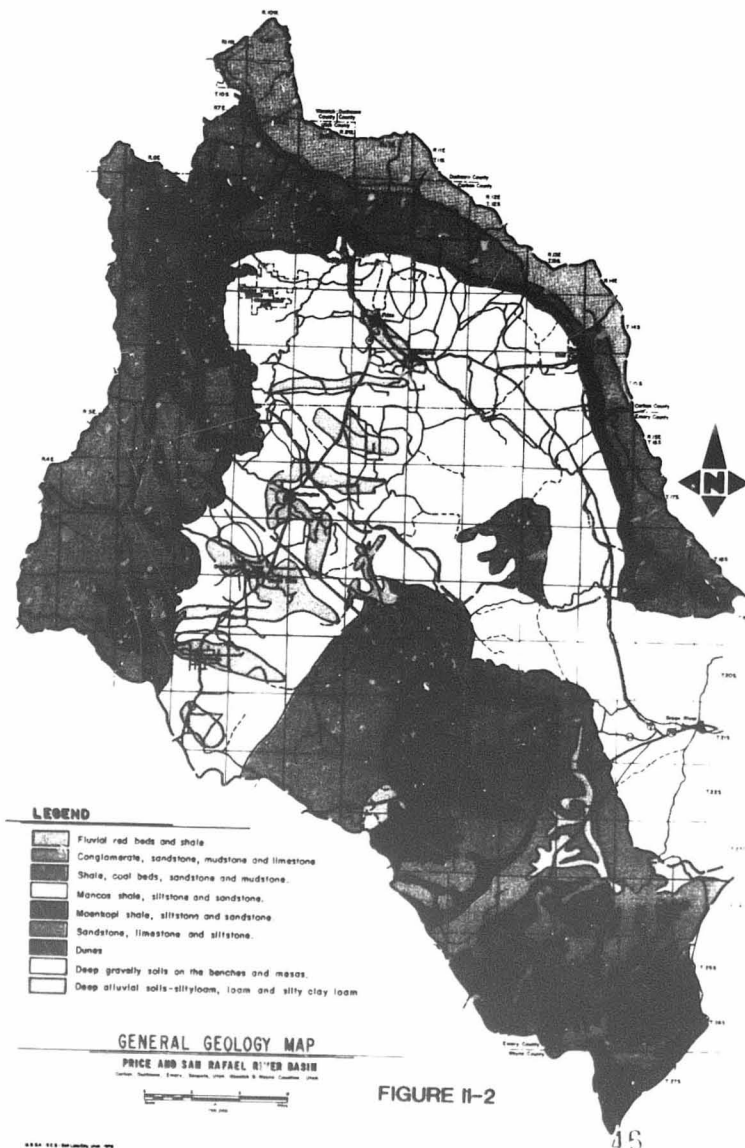


FIGURE II-2

Huntington Creek were first appropriated in 1876, and diversion began from Cottonwood, Muddy, and Ferron Creeks shortly afterward. By 1900, dependable flows in the San Rafael River basin had been appropriated. The Mammoth Reservoir Company, formed in 1896 to develop water from the Price River, had appropriated the dependable flows in that river by 1911.

The first irrigation canal systems were small projects constructed with horse-drawn plows and scrapers, while larger and longer canals were installed as the demand for irrigation water increased. The irrigation systems expanded with little overall planning; as a result, even today the canals parallel each other for long distances, cross each other, and are generally inefficient water delivery systems. Most of the canals do not have adequate diversion structures, measuring devices, dividers, or other water control structures.

Currently, most of the agriculture in the Price-San Rafael area is livestock related, and most of the crops are for feed and forage, with alfalfa hay, grass pasture, small grains, and corn silage predominating and accounting for 99 percent of all irrigated land.

Most of the farmers in the area have off-farm jobs to supplement farm income and attend to farming on a part-time basis. As a result, farming operations are of secondary priority, and off-farm obligations impose constraints on management capability.

Water users have avoided sprinkler irrigation because of increased power costs to pressurize the systems, although such irrigation is used on about 200 acres of existing pumped sprinkler systems in the Molen Seep Wash area near Moore.

Existing canals in the Price-San Rafael Rivers area serve up to 48,910 acres, or about 0.85 mile of canals per 100 acres of irrigated land. There is a total of about 400 miles of canals, laterals, and sublaterals in the project area. This distribution system is largely unlined, although some open ditch laterals have been replaced by pipelines under a current cost-share program.

As noted, although more than two-thirds of approximately 66,450 acres with water rights are irrigated² in an average year, a sizeable amount of land remains unirrigated. This stems from two factors—an inadequate water supply for acres with adjudicated water rights and inefficient onfarm irrigation delivery and practices. All of the irrigation systems have the benefit of some reservoir storage capacity but are dependent on snowmelt runoff for most of the supply. The amount of snowmelt runoff varies from an excess in late spring to a deficiency in late summer months.

² Since 1967, the Utah Power and Light Company (UP&L) has been purchasing water rights in the Price-San Rafael basin and retiring the land associated with the water. To date, UP&L has purchased water rights from the Ferron, Cottonwood, and Huntington-Cleveland Irrigation Companies. This 48,400 acre-feet of water and its corresponding acreage are excluded from the no action alternative.

Accordingly, the common practice is to over-irrigate during early spring runoff and again in the late irrigation season. During the spring, available water is spread over more acres than can be supported for a full season of irrigation. Later, crops suffer from an inadequate water supply during the summer. Lower crop yields result, and heavy salt loading occurs in May and June when there is an excess supply of water. Historical water delivery records show an average water delivery of 2.3 acre-feet per acre in an area which, depending on irrigation efficiency, requires 3 to 6 acre-feet per acre for a full-season water supply. Water lost from conveyance and onfarm irrigation contributes to the salt loading of the Colorado River, to deterioration of the low-lying farmland through salt buildup, and to an increased phreatophyte community.³ Although a portion of the lost water is used by crops through reuse, the present overall efficiency of water use in the study area is about 35 percent.

Farmlands in the Price-San Rafael Rivers Unit currently are irrigated almost entirely by surface irrigation. The most common irrigation method is accomplished by running water downslope through corrugations. Present set times are 12 to 24 hours. As the water flows down the irrigation run, it spreads laterally, resulting in a fan-shaped area of coverage which, because of surface irregularities, leaves many areas dry. This practice contributes to uneven distribution of water, irrigation water shortages in summer, and lost farm income.

Typically, a canal system in the area consists of a structure across a natural stream which diverts water into the system, a main canal which follows the natural-elevation contour out of the canyon and above the irrigated area, and laterals from the main canal which run downslope to pockets of irrigated land interspersed with nonirrigated areas. The only maintenance performed is generally that required to keep flow paths open by removal of bedload deposition and vegetation within the channel and phreatophyte growth on canal embankments.

EXISTING WINTER STOCK WATERING SYSTEMS AND PRACTICES

At present, winter deliveries of livestock water are made through piped domestic water systems or through the canal system, often with varying degrees of overlap. In some areas, canal flows, or water intentionally wasted from canals into natural drains, serve as the water source for livestock; more commonly, however, canal water is delivered into and stored in stock ponds, which are filled from one to several times per year, depending on the availability, reliability, and cost of alternate sources.

³ Phreatophytes are deep-rooted plants that obtain water from the water table or the layer of soil just above it.

Canals in the Carbon, Huntington-Cleveland, and Cottonwood Creek systems are operated in winter to deliver water for livestock and for municipal use. Canal seepage during winter operation is a source of additional salt loading. Canal seepage is estimated at a total of 3,800 acre-feet in the San Rafael River basin and 3,200 acre-feet in the Price River basin. An additional 1,900 acre-feet is contributed by stock pond seepage.

Specific winter water practices in each locality vary significantly according to existing constraints and capabilities of the respective systems. The more reliable and less expensive the domestic water supply, the more likely that a domestic system provides stockwater and the less extensively stock ponds are used.

The largest domestic supplier within the project area is the Price River Water Improvement District, which serves as a wholesaler to Price City and most of the adjacent communities. The system has the capacity to deliver up to 4 million gallons per day (Mgal/d), but is presently delivering only about 2 Mgal/d. The district, which operates a treatment plant near its point of diversion on the Price River, has both direct flow and stored water from Scofield Reservoir. The district operates under contract the Miller Creek Special Service District system, to which it sells water.

The smaller North Emery Water Users Association serves rural areas of north Emery County. The spring-fed system delivers about 0.5 Mgal/d in an average year through 450 connections.

Two special conditions exist in the Cottonwood Creek Consolidated Irrigation Company in connection with stockwater practices. First, the company has already constructed a separate stockwater pipeline system connected to the UP&L water line that delivers water from Cottonwood Creek to the Hunter Powerplant. Despite this, canals in the area continue winter operation for livestock water because of insufficient pressurization and leaking in UP&L's main line. In addition, raw water for the Orangeville and Castle Dale domestic water treatment plants is delivered through the Mammoth Canal, which must be operated year-round to make domestic water deliveries.

CHAPTER III Resources and Constraints

CHAPTER III

RESOURCES AND CONSTRAINTS

This chapter discusses resources that would be necessary ingredients to the formulation of viable alternative plans for reducing the salt contribution to the Colorado River Basin.

Improvement of quality in the existing water resource and the maintenance of that resource constitute the statutory underpinning of this and other Colorado River Water Quality Improvement Program/Colorado River Salinity Control (CRWQIP/CRSC) projects. The CRWQIP/CRSC, then, provides the opportunity to maintain the quality of the water supply in the Price-San Rafael Rivers basin, within the constraints of water rights laws and environmental constraints.

WATER SUPPLY AND WATER RIGHTS

Water Supply

Water supplies in the upper 155 square miles of the Price River basin are controlled by the 74,000-acre-foot Scofield Reservoir. The average annual inflow of the Price River (including 24,600 acre-feet diverted from the San Rafael River basin) is approximately 112,420 acre-feet, of which approximately 93,200 acre-feet are diverted, primarily for irrigation. More than 80 percent of the annual flow occurs from April through August. The average annual outflow of Price River is approximately 74,000 acre-feet at Woodside.

The San Rafael River is formed by three major tributaries—Huntington, Cottonwood, and Ferron Creeks. The capacities of the eight largest reservoirs on these tributaries range from 500 to 62,500 acre-feet. Of total average annual inflow estimated at 199,840 acre-feet, approximately 109,500 acre-feet are diverted, primarily for irrigation, of which 24,600 acre-feet are delivered into the Price River basin. Annual outflow of the San Rafael River is approximately 81,000 acre-feet.

The 24,600 acre-feet transbasin diversion from the San Rafael River basin into the Price River basin is via the Cleveland Canal and South Branch of the Cleveland Canal and from Muddy Creek in the Dirty Devil River basin.

An approximate flow diagram for the combined Price-San Rafael Rivers under the no action condition is shown on accompanying figure III-1.

Water Rights and Related Constraints

The State Engineer for Utah has been delegated the general administrative supervision of the waters of Utah, both surface and underground. Water rights

in Utah are based on the prior appropriation doctrine, and as such they are considered a property right. Owners of a water right are entitled to use their water right as they wish within the bounds of State water law.

Utah State water law allows water to be used for domestic, stockwatering, irrigation, municipal, power, manufacturing, mining, and fish culture purposes. Recently, instream flows have received recognition as a beneficial use, but only when such rights are held in the name of the Utah Division of Wildlife Resources. In addition, comments regarding this project received from the State Engineer included the statement, "We would accept applications by individuals for the purpose of irrigating marsh lands on their property for wildlife and waterfowl habitat."

Under the Prior Appropriations Doctrine, water rights are administered on a priority system or in other words, "First in time, first in right." In times of shortage, those water rights with lower priorities (filed later in time) are cut off so that higher priority rights can be satisfied.

Once an individual or an organization has been granted a water right by the State Engineer, a period of 5 years is allowed to put the water to beneficial use and perfect the water right. Extensions (generally 5 years) may be granted by the State Engineer on a case-by-case basis if additional time is needed to demonstrate beneficial diversion and use of water. If beneficial use is not demonstrated in 5 years and an extension of time is not received by the applicant, the water right is forfeited and reverts back to the public. Likewise, if a water right is abandoned or if use of the water right ceases for a period of 5 years without the owner applying for, and the State Engineer granting the right to resume use, forfeiture of the water right occurs.

It is the duty of the State Engineer to ensure that all water rights are satisfied to the extent allowed by law and priority. This is accomplished, for the most part, by the area engineer and river commissioners for each area.

Water rights in the project area are of two basic types—privately held and project water rights. Privately held water rights are those held by individuals or companies. Project water rights provide water for municipal, industrial, irrigation, stockwatering, and other purposes from the Scofield and Emery County projects which were constructed by the Bureau of Reclamation (Reclamation). The Scofield Project is managed and operated by the Carbon Water Conservancy District. The Emery County Project is managed and operated by the Emery County Water Conservancy District. Under the proposed salinity project, the administration of these water rights will occur as it has in the past.

As is the case in most of the arid Western United States, water resources in Utah are limited. As a result, there is much concern about how water rights are administered and protected, particularly by those whose livelihoods are dependent on this resource.

Adjudicated Price River waters are used as follows: water from the Carbon, Price-Wellington, or the Cleveland Canal systems are used exclusively for farm use with no direct use for domestic or industrial purposes. The Carbon Canal Company and the Price-Wellington Canal Company have direct-flow rights in the Price River and storage rights in Scofield Reservoir. Carbon Canal has a winter water right of approximately 25 cubic feet per second (ft³/s) for livestock.

The towns of Castle Dale and Orangeville divert directly from the Mammoth Canal, and other towns in the area divert from local creeks or reservoirs. The Huntington-Cleveland Canal diverts approximately one-half of its annual total diversion in the Price River basin. The waters of Huntington and Cottonwood Creeks have been adjudicated while those of Muddy and Ferron Creeks have not. The Huntington-Cleveland Canal Company owns primary flow rights in Huntington Creek and has storage rights in four reservoirs in Huntington Creek: Millers Flat, Huntington, Cleveland, and Huntington North Reservoirs. The company also owns water storage rights in Joes Valley Reservoir on Cottonwood Creek.

In order to be considered as a possible solution to salinity problems, the proposed alternative must be in conformance with Utah water law.

The hydrosalinity model has projected a 25,310 acre-foot depletion of water to the Colorado River as a result of this salinity project. This may not be a problem from the standpoint of interstate water agreements. However, there may be some impact within the immediate drainage basin for those whose water rights have relied on return flows that will be diminished. These issues will be resolved through the appropriate administrative channels as directed by the State Engineer on a case-by-case basis.

TECHNOLOGY AND SALINE WATER USE/DISPOSAL

The CRWQIP could also provide the opportunity to use the technology resource for industrial use of saline water. Generally, industrial use of saline water has not proven cost effective at present, as discussed in chapter IV under nonviable alternatives.

In agriculture, the use of saline water is possible by use of a leaching fraction to keep the salts below plant root level.

Although the State has been given the mandate to reduce salinity in the Colorado River, limitations exist on the use and disposal of saline water. For example, evaporation ponds would deplete a portion of the State's allocation of Colorado River supplies.

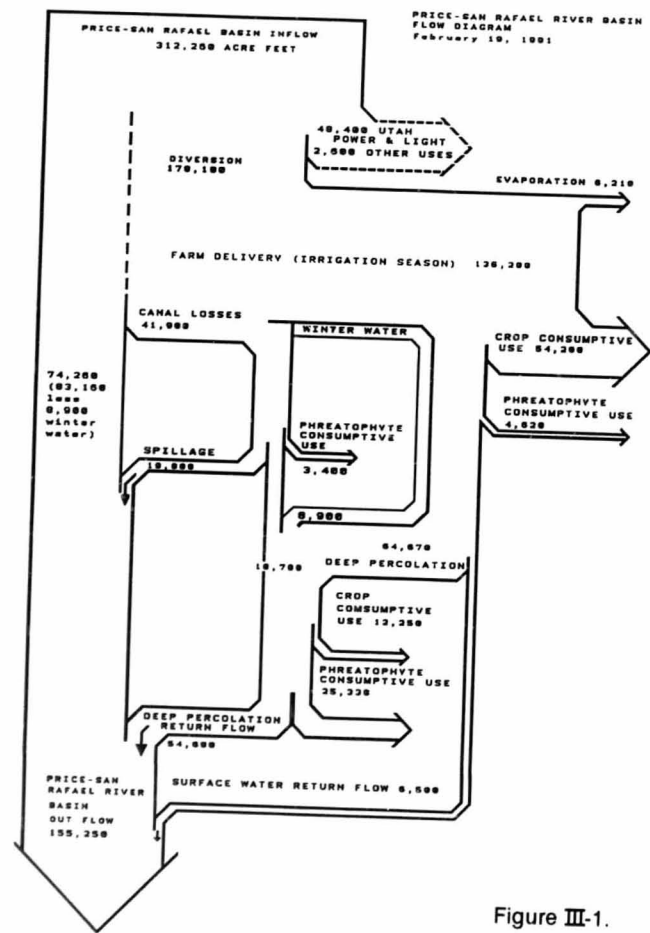


Figure III-1.

Other schemes for the disposal of saline drainwater included transportation of the water out of the basin, tar sands development, use of saline water at existing powerplants, and evaporation. All of these proposals presented problems, as noted in chapter IV.

ENVIRONMENTAL CONSTRAINTS AND CONFLICTS

Constraints that would limit the project include the cited physical, statutory, and institutional limitations, and also environmental factors discussed in greater detail in chapter V. Although several potential environmental problems are associated with salinity reduction proposals for the Price and San Rafael Rivers drainages, the greatest concern, as discussed earlier, centers on the potential loss of irrigation-supported wetlands resulting from changes in existing water use practices. Wetland types most likely to be affected include palustrine forested or riparian areas; palustrine emergent wetlands (sedges, brushes, and grass); the typical marsh; slough; or wet meadow. Potential wetland losses are of concern because of their substantial value to a wide variety of wildlife species and because of wetlands protection's status as a nationally mandated concern.

The Soil Conservation Service (SCS) is charged with providing technical assistance to control the salinity problem caused by deep percolation of excessive irrigation water. This saline water often supports wetlands and riparian vegetation, and it can contribute to aquatic habitat that would not normally occur in this arid environment. Water conservation reduces deep percolation and the occurrence of wetland/riparian vegetation supported by irrigation water.

The concept of improving irrigation efficiency to reduce the salt load (improved water quality) carried to the Colorado River presents a conflict with the environmental values of protecting irrigation-induced wetlands, riparian vegetation, and aquatic habitats. The Colorado River Basin Salinity Control Act (Public Law 93-320, as amended) establishes water quality improvement (salt reduction) as the objective. A purpose of this document is to present the environmental effects involved in improving water quality while reducing the amount of water that supports irrigation-induced wetlands, riparian vegetation, and fisheries and, at the same time, attempting to minimize adverse impacts.

Mandatory replacement of fish and wildlife habitat is outside the authority of the United States Department of Agriculture (USDA) and Public Law 93-320. The law did not authorize mitigation for the loss of irrigation-induced wetlands or other fish and wildlife habitat. However, Public Law 98-569 amended section 202(c) of Public Law 93-320 (43 U.S.C. 1592) and authorizes technical assistance and cost-share funds for the voluntary replacement of fish and wildlife habitat values foregone. The funds would be provided at the same cost-share rate as irrigation practices.

Maintenance of existing habitat or replacement of fish and wildlife habitat values would be encouraged and are a priority; however, implementation of any alternative is a voluntary decision of the landowner/user.

CHAPTER IV
Alternatives

CHAPTER IV
ALTERNATIVES

The plan formulation process for the Price-San Rafael Rivers Unit (Unit) included evaluations by the Soil Conservation Service (SCS) and the Bureau of Reclamation (Reclamation) of the onfarm and off-farm salinity control alternatives. These plans were originally independent of one another; however, as plans evolved, it became apparent that a combined SCS and Reclamation program of onfarm and off-farm improvements would create a more effective and efficient program than either agency could achieve on its own. Although each agency has continued its planning process for its respective area of concern, combining the onfarm and off-farm systems allowed a plan to be developed that takes advantage of the pressure provided by piped laterals (off-farm) to be used to operate sprinkler systems (onfarm). This concept is common to both of the action alternatives (Resource Protection [RP] and National Economic Development [NED]).

On their own, neither SCS sprinkler systems nor Reclamation piped laterals are viable alternatives. As a separate entity, piped laterals are not cost effective. Similarly, independent sprinkler systems are not feasible; they cannot operate without the pressure created by piped laterals. But by combining piped lateral and sprinkler systems into one integrated system, the benefit (as measured by cost to remove a unit ton of salt) can be greatly improved. The combined system is competitive with other salinity control units in the Colorado River Basin. Also, because of the units' interdependence, this report benefits from a better opportunity for a comprehensive environmental analysis.

This document is intended to meet the planning needs of Reclamation and SCS as well as National Environmental Policy Act compliance responsibilities. Because of this dual purpose, the following format has been used: the chapter begins with a discussion of how the alternatives were formulated and identifies various evaluation criteria; these criteria are used to test and eliminate nonviable alternatives; and the viable alternatives, including the no action alternative, are then evaluated in detail, including a four-account analysis that conforms to the Water Resources Council's *Principles and Guidelines of Water and Related Land Resources Implementation Studies (Principles and Guidelines)*.

The preferred plan (the RP alternative) in this document includes Reclamation's off-farm irrigation systems and winter water improvement—combined with SCS' onfarm plan which includes sprinkler irrigation and improved surface irrigation management. The combined NED alternative is displayed for comparison purposes and is identical to the RP alternative except for the addition of improved surface irrigation to the RP alternative.

STANDARDS FOR PLANS

Both agencies' alternatives were evaluated in accordance with the *Principles and Guidelines*. In addition, the SCS and Reclamation plan formulation process consists of the following major steps:

- Identifying existing and projected problems and needs.
- Evaluating resource capabilities.
- Formulating alternative plans to solve problems and meet needs with available resources.
- Analyzing the alternative plans to determine the advantages and disadvantages of each.
- Selecting the preferred plan from among viable alternatives.

Plan Selection Criteria

The *Principles and Guidelines* mandate four tests of viability to be considered for each alternative. The tests assess the completeness, effectiveness, efficiency, and acceptability of the alternative plans.

Viability and Other Tests

Completeness is the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects. *Effectiveness* is the extent to which an alternative plan alleviates the identified problems and achieves the specified objectives.

Efficiency is the extent to which an alternative plan is the most cost-effective means of alleviating the identified problems and realizing the specified objectives. *Acceptability* is the workability and viability of the alternative plan with respect to acceptance by the public and compatibility with existing laws, regulations, and public policies. Alternatives which meet a minimum standard under all four tests are to be considered viable plans and investigated in greater detail.

The four accounts specified in the *Principles and Guidelines* are used to display and evaluate information on the effects of viable plans—the NED, the Environmental Quality (EQ), the Regional Economic Development (RED), and the Social Effects (SE) accounts. Each account describes particular aspects of anticipated effects of the viable alternatives on the environment.

The NED account measures changes in the economic value of the national output of goods and services, while the EQ account measures significant effects on natural and cultural resources. The RED account measures changes in the distribution of regional economic activity, and the SE account measures effects from perspectives that are relevant but that are not reflected in the other three accounts.

The *Principles and Guidelines* plan selection criteria state the plan must be chosen which maximizes net NED benefits as the preferred plan, or Reclamation must obtain an exception from the Secretary of the Interior to formulate a plan to meet other needs.

Cost Effectiveness

For units of the Colorado River Water Quality Improvement Program (CRWQIP) studied by Reclamation, a traditional comparison of benefits and costs is not totally valid since the benefits accrue from the reduction of salinity in the Colorado River and have not been fully quantified, while construction costs are estimated to a much higher accuracy. Therefore, Reclamation has obtained an endorsement from the Assistant Secretary, Land and Water Resources, on a proposal that units of the CRWQIP be excepted from the *Principles and Guidelines'* maximization criterion and that cost effectiveness be used to select the preferred plan (cost effectiveness is defined as the cost to the Federal Government to prevent a ton of salt from reaching the Colorado River System and is expressed in dollars per ton).

On October 29, 1983, the Acting Assistant Secretary of the U.S. Department of the Interior endorsed the general principle that all CRWQIP projects be excepted in advance from the *Principles and Guidelines'* NED maximization criterion. Public Law 93-320 requires cost effectiveness as the controlling criterion for prioritizing salinity reduction plans for Reclamation and the United States Department of Agriculture (USDA). As a result, planning for individual salinity control projects under the general guidance of the *Principles and Guidelines* employs the specific criterion of cost effectiveness.

The SCS follows the *Principles and Guidelines* in the formulation of alternatives. SCS formulates a NED alternative which maximizes net benefits and other alternatives to address the problem in the area. SCS formulates a RP plan which may add increments to the NED alternatives to reduce salt loading in the Colorado River. The RP alternative must meet the four criteria for formulation and may be preferred in place of the NED alternative.

The SCS criteria for plan selection are based on the contribution of a given plan to accomplish:

- Environmental quality by reducing the salt load to the Colorado River and giving consideration to fish and wildlife resources.
- Landowner acceptance by increasing the efficiency of agricultural production and income.

SCS criteria to select the preferred plan include four tests of viability, and landowner acceptance is vital to achieve implementation.

SCS also follows legislative mandate in obtaining funding with a cost-effective plan, as noted above, giving preference to units which reduce salinity at the least cost per unit.

PLAN FORMULATION

Onfarm

The SCS identified six subunits within the Price and San Rafael River basins in order to simplify data collection and alternative plan development and evaluation. This was necessary in part because the locations of irrigated lands within the study unit are highly dispersed, as shown on figure I-1. The subunits include those served by the six major irrigation systems—Price-Wellington Canal, Carbon Canal, Huntington-Cleveland Canal, Cottonwood Canal, Ferron Canal, and Moore Canal systems. In general, the subunits are separated out by the canal system that serves them; the Huntington-Cleveland subunits in some instances were evaluated separately since water flows into both river basin areas, but flows were reaggregated for most planning purposes. In addition, an estimated 1,500 acres of scattered, isolated lands within the two river basins are irrigated. These acres are included in the 45,280 acres of irrigated land.

Two alternatives were developed and evaluated by SCS for each of the subunits—one to meet the criterion of net benefit maximization (the NED alternative); the second to meet the RP goal (the RP alternative).

SCS' evaluation resulted in the following onfarm alternative plans for salinity reduction in the Unit area:

- Improved surface irrigation only (e.g., land leveling, different irrigation methods, water control devices), emphasizing improved water management practices (e.g., converting from fixed delivery to demand delivery schedules).
- Sprinkler irrigation with improved irrigation water management.

- A combination of improved surface irrigation, sprinkler irrigation, and improved water management.
- No project action.

Off-farm

Considering only off-farm components, Reclamation narrowed the alternatives to the following:

- Winter water replacement.
- Off-farm irrigation systems improvement in conjunction with the onfarm sprinkler improvement.
- Off-farm irrigation systems improvements.
- Drainwater treatment, disposal, or use for cooling or industry.
- Selective withdrawal.
- Retirement of farmland.
- Fresh water for other beneficial use.

ALTERNATIVE PLANS

Resource Protection Alternative (Preferred Plan)

This alternative was formulated to optimize salinity reduction while providing the least cost-per-ton of decreased salt loading and meeting the four tests of viability. The estimated cost effectiveness of the SCS and Reclamation alternative is \$39 per ton. Treatment of these acres is shown in figure IV-1. This alternative removes 161,000 tons of salt per year, as shown in table IV-1 and attachment IX.

The RP alternative is designed to reduce salinity to the Colorado River from the Price-San Rafael Rivers basins by reducing area outflow. These outflows are responsible for transporting salts into the Price-San Rafael Rivers. The RP program consists of the following measures:

- Constructing an integrated system of pressure laterals, pipelines, and sprinkler systems.
- Improving onfarm surface irrigation facilities.

Figure IV-1

Project Acreage Resource Protection

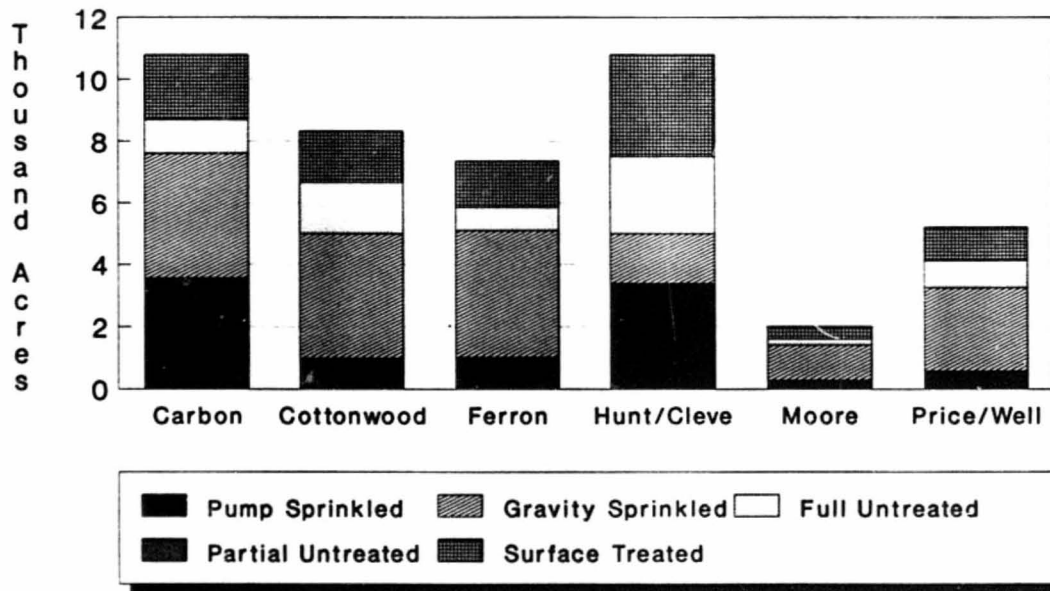


Table IV-1.—Subunit salt load reduction - RP plan¹

Subunit	Off-farm (Reclamation)			Soil Conservation Service		Total irrigation improvement salt load reduction (tons)	Winter water improvement salt load reduction (tons) ⁴	Total salt load reduction (tons)
	Open laterals replaced (miles) ²	Laterals seepage reduction (acre-feet) ³	Laterals salt load reduction (tons) ⁴	Onfarm deep percolation reduction (acre-feet)	Onfarm salt load reduction (tons) ⁴			
Carbon	36.6	490	2,458	6,582	33,014	35,472		
Cleveland	8.5	114	572	3,950	19,812	20,384		
Price-Wellington	23.6	316	1,585	3,419	17,149	18,734		
Price River basin totals	68.7	920	4,615	13,951	69,975	74,590	⁵ 18,356	92,946
Huntington	21.5	225	822	3,064	11,185	12,007		
Cottonwood	25.8	269	982	5,107	18,642	19,624		
Ferron	34.8	363	1,325	4,393	16,037	17,362		
Moore	5.1	53	193	1,200	4,381	4,574		
San Rafael River basin totals	87.2	910	3,322	13,764	50,245	53,567	⁶ 14,529	68,096
Total for Price and San Rafael River basins	155.9	1,830	7,937	27,715	120,220	128,157	32,885	161,040

¹ Canal seepage figures presented in table IV-1 are derived from a series of ponding tests which produced a loss rate of 0.23 ft³/ft²/day. This number in turn was applied to the wetted area to calculate a volume loss per unit time per unit length of canal. On-farm deep percolation reduction was calculated by SCS and agreed to by Reclamation. The winter water improvement is the result of removing the need to carry water in the canals over the winter. Canal loss rates, times, and lengths were used to calculate a yearly volume of winter reductions. Based on CH₂M-Hill study performed during 1982-84 under contract No. 1-07-40-S1637 with Reclamation.

² Includes the 6.8-mile Clipper Canal. Based on CH₂M-Hill study performed during 1982-84 under contract No. 1-07-40-S1637 with Reclamation.

³ Based on 13.4 acre-feet per mile for Price River basin and 10.4 acre-feet per mile for San Rafael River basin.

⁴ Based on 5.0156 tons per acre-foot for Price River basin and 3.6506 tons per acre-foot for San Rafael River basin.

⁵ Based on seepage reductions of 3,200 acre-feet for winter water and 460 acre-feet for stock pond programs.

⁶ Based on seepage reductions of 3,800 acre-feet for winter water and 180 acre-feet for stock pond programs.

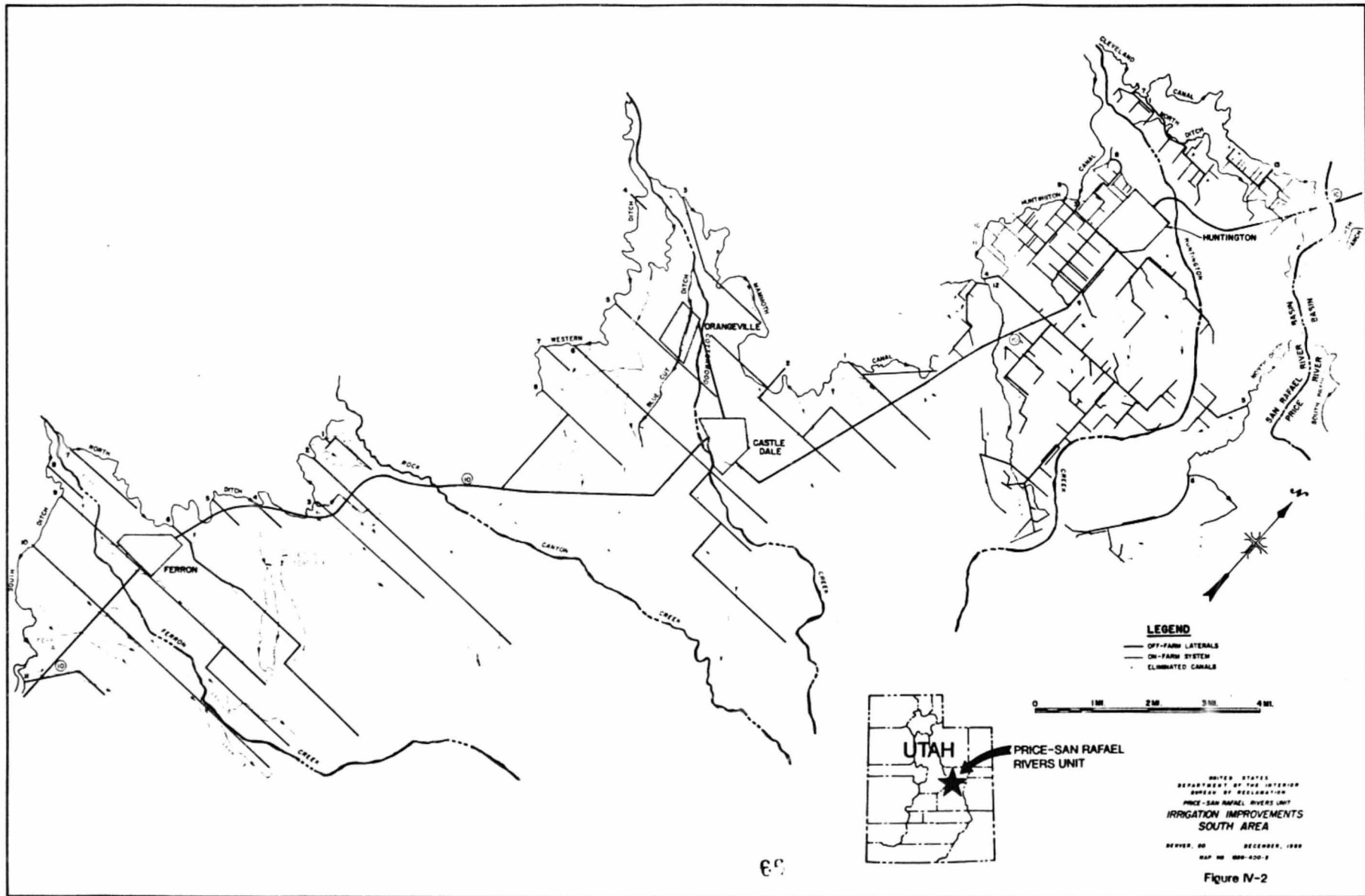
- Improving onfarm irrigation management.
- Eliminating canal conveyance of winter water by providing replacement of stockwater facilities and an associated municipal and industrial (M&I) pipeline.

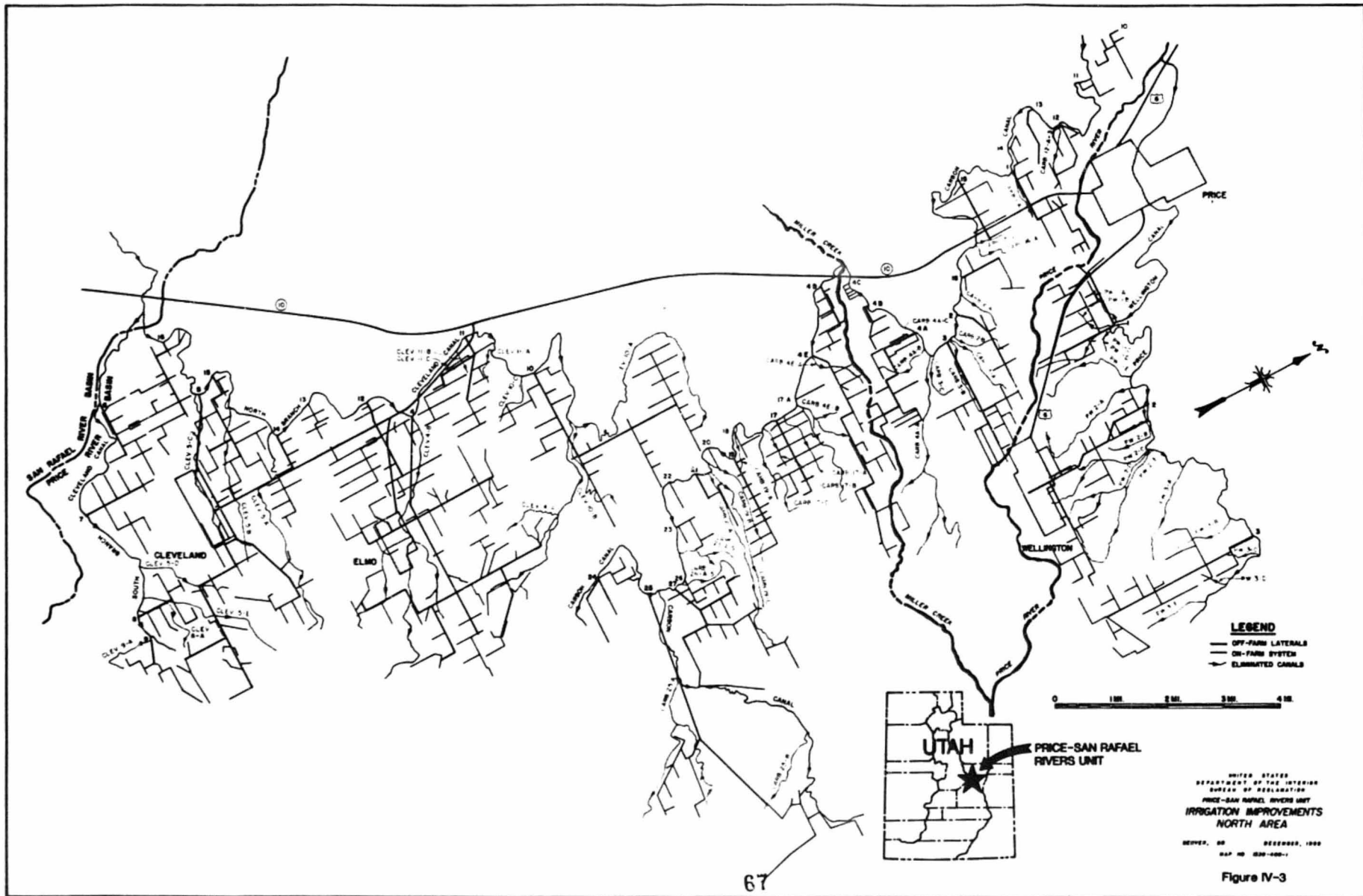
This alternative is a combination of onfarm and off-farm irrigation systems treatment and management practices that could realistically be implemented and also includes winter water replacement of livestock water. The plan meets the four tests of viability (completeness, effectiveness, efficiency, and acceptability) by the addition of improved surface irrigation. This plan removes a greater amount of salt than the sprinkler-only (NED) alternative (161,000 tons per year versus 147,600 tons per year). While the additional increment for improved surface irrigation management results in a plan that is not as cost effective (\$39 per ton for the RP alternative) as the NED alternative (\$33 per ton), it addresses the identified problem and the objectives of the salinity control program in a cost-effective manner and provides greater flexibility to landowners, which results in greater participation. Therefore, it was selected as the RP plan.

Irrigation Improvement Increment

The irrigation improvement increment would be implemented jointly by Reclamation and USDA, with salt reduction increments as shown in table IV-1. Examples of potential layouts are shown in figures IV-2 and IV-3. This part of the plan would result in approximately 36,050 acres in the project area receiving some form of irrigation improvement. Of this total, 16,350 acres would be treated with gravity sprinkler systems and management, 9,650 acres would be treated with pump pressure sprinkler systems and management, and 10,050 acres would be treated with improved surface irrigation systems and management. These acreages are the result of a subunit-by-subunit estimate by the SCS of a likely level of farmer participation. An estimated 29,060 acres in the project area would either remain idle, receive partial irrigation, or would not participate in the project, as decided by the landowner.

Reclamation would design and construct off-farm facilities to provide gravity pressure to the onfarm sprinkler systems. SCS would furnish technical assistance for its design and inspection of onfarm facilities. Because of the voluntary participation aspect of the USDA portion of this plan, the specific location of onfarm and off-farm facilities and laterals to be discontinued from service cannot be identified at this time. For planning purposes, Reclamation and the SCS have planned and developed detailed cost estimates for an off-farm lateral system capable of serving the entire project area.





LEGEND
 — OFF-FARM LATERALS
 - - - ON-FARM SYSTEMS
 - / - ELIMINATED CANALS

0 1MI. 2MI. 3MI. 4MI.

UTAH
 PRICE-SAN RAFAEL RIVERS UNIT

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 PRICE-SAN RAFAEL RIVERS UNIT
 IRRIGATION IMPROVEMENTS
 NORTH AREA
 DENVER, CO. DESIGNED, 1969
 MAP NO. 330-400-1

67

67

Figure IV-3

Onfarm Facilities

Onfarm facilities would include the installation and application of sprinkler irrigation systems, improved surface irrigation, and water management.

The projected average onfarm irrigation efficiency of this alternative would be about 60 percent. About 27,340 acres (under sprinkler) would be irrigated with an efficiency between 60 and 65 percent; 10,050 acres (under improved surface irrigation) would have an efficiency between 50 and 55 percent; and 1,340 acres (already treated) would have an efficiency between 60 and 65 percent. About 7,890 acres (not treated or participating) would be irrigated with an efficiency of 35 percent or less.

Sprinkler Irrigation Systems.—The majority of the irrigated acres receiving treatment would be improved through the installation of either gravity pressure sprinkler systems or pump pressurized sprinkler systems. Sprinkler system installations would include, but not be limited to, mains and laterals connecting to off-farm mains, onfarm distribution pipelines with risers, surface sprinkler hardware (side roll or pivot sprinklers), pump and motors and/or gravity pressure generating pipelines (generally serving two or more water users), and water measuring devices. Sprinklers are particularly well suited to shallow soils with undulating topography; however, they can also be used on flat slopes and deep soils.

Improved Surface Irrigation Systems.—The improved surface irrigation system would involve a range of improvements to onfarm facilities. Onfarm improvements would include those practices necessary to achieve program irrigation efficiency goals of 50 to 55 percent for surface irrigation. These practices could include, but are not limited to, water measuring devices, water control structures, land leveling, pipelines, gated pipe, borders, automated water control valves, and tail water recovery systems. Surface systems would be installed only on flat slopes and deep soils.

Irrigation water management would be a part of both sprinkler irrigation and improved surface irrigation. In an effort to improve irrigation water management skills, technical assistance and climatological data collecting would be provided to water users, irrigation companies, and groups.

There would be localized climatological data collecting stations installed at strategic sites. The information from these stations would assist the water users in determining crop water use throughout an irrigation season.

Technical assistance would consist of working with irrigation companies to improve management of irrigation water delivery and water application. In some cases, assistance might be provided to them to help convert from a fixed schedule delivery to demand delivery of irrigation water. This would allow the water user to call for water as needed. Assistance would be provided to each

water user on a one-on-one basis to evaluate and modify, as needed, present irrigation methods. Assistance would also be provided to the landowner on other management practices to improve resource management skills, including those affecting wildlife habitat, pasture, cropland, and rangeland.

Salinity control plans (SCP's) would be written with each landowner. SCP's are used to implement the program and are the basis for salinity control. These contracts cover the acreage of a farm which, through formal contract entered into by the landowners or land user and the administering agency, would be improved and managed to conserve water and reduce salt loading. Accelerated, ongoing USDA conservation programs may also be used to implement the onfarm water conservation and salinity control measures.

Off-farm Irrigation Facilities

Gravity pressure for the sprinkler irrigation systems would be developed by constructing piped laterals fed by the unimproved main canals. Where possible, pressure would be developed by gravity; however, in many locations booster pumps (at the farm) would be required to increase pressure. With the exception of a new turnout structure for each pressure lateral, no improvements would be made to the main canals. A sediment settling structure would be constructed at the head of each pipe lateral. Accumulated sediment would be sluiced periodically from the structure through a gate at the low end.

Reclamation would construct lateral turnouts and sediment settling structures; however, pump stations to increase pressure in the laterals and pipelines would be an onfarm facility. Although an exact system cannot be specified, it is estimated that Reclamation would construct approximately 97 miles of pipe laterals ranging in size from 33 inches to 8 inches in diameter. Through consolidation and replacement, a total of approximately 156 miles of open, unlined laterals and canals are projected to be eliminated under the preferred plan. These waterways are primarily laterals, but the Clipper Canal, a 6.8-mile canal in the Cottonwood Creek area, could be eliminated as well. The Western Canal would then be enlarged from its present capacity of 40 cubic feet per second (ft³/s) to 70 ft³/s in order to accommodate Clipper Canal flows but would remain unlined.

Winter Water Replacement Increment

Additional salt loading occurs from seepage when canals in the Carbon, Huntington-Cleveland, and Cottonwood Creek systems are operated in winter to deliver water for livestock and for municipal use in the cities of Orangeville and Castle Dale. The plan provides for winter water to be supplied from other sources and for dewatering all project area canals in winter to eliminate winter seepage and salt loading. By accomplishing this dewatering of the Price and

San Rafael area canal systems in winter and lining stock ponds, it is estimated that salt loading to the Colorado River would be reduced by about 32,880 tons. Major winter water improvements are shown in figure IV-4. In locations where canals have been used as barriers for livestock, fences will be constructed to keep livestock from escaping.

Domestic Delivery Systems.—On the Carbon and Huntington-Cleveland Canal systems, seepage losses from the delivery of winter water would be eliminated by a program of providing domestic service connections for winter livestock water and by lining or constructing stockwater ponds. In locations where livestock water needs are near existing domestic systems, a connection would be made to the system, and an automatic livestock waterer would be installed to provide winter water, as shown on figure IV-5. Water would be delivered through the existing systems of three major domestic water suppliers in the project area. Replacement water for the Carbon Canal water users would be delivered through the Price River Water Improvement District (PRWID) system and the Miller Creek Special Service District system. Replacement water for Huntington-Cleveland Irrigation Company water users would be delivered through the North Emery Water Users Association (NEWUA) system.

Approximately 14 connections would be required to the PRWID, the largest domestic supplier within the project area and wholesaler to Price and adjacent communities. About 36 connections would be required for the Miller Creek Special Service District system, operated by the PRWID, and about 163 connections for the smaller NEWUA. In the remainder of this report, the facilities added to the Miller Creek Special Service District are considered a part of the PRWID system.

The number of connections required under each system was determined by field verification of the number of stock ponds in actual use within each service area. The number of ponds to be replaced was increased by 25 percent to account for locations where livestock drink directly from the canals and laterals. Following construction authorization, the specific number and locations of the domestic system addition would be negotiated by Reclamation with the pond owner, the irrigation company currently supplying that pond owner, and the domestic water supplier.

Cottonwood Creek Line.—In the Cottonwood Creek area, a new pipeline would be constructed to deliver water to the existing but inconsistently used livestock water system and to the Orangeville and Castle Dale water treatment plants. This pipeline would replace winter M&I deliveries through the Mammoth Canal, and it would replace stockwater deliveries through area canals. The pipeline would begin near the diversion structure for the Western-Clipper Canal, the highest diversion on Cottonwood Creek, and would extend to the Castle Dale water treatment plant. A relatively short service line would branch off the main line to deliver water to the Orangeville water treatment

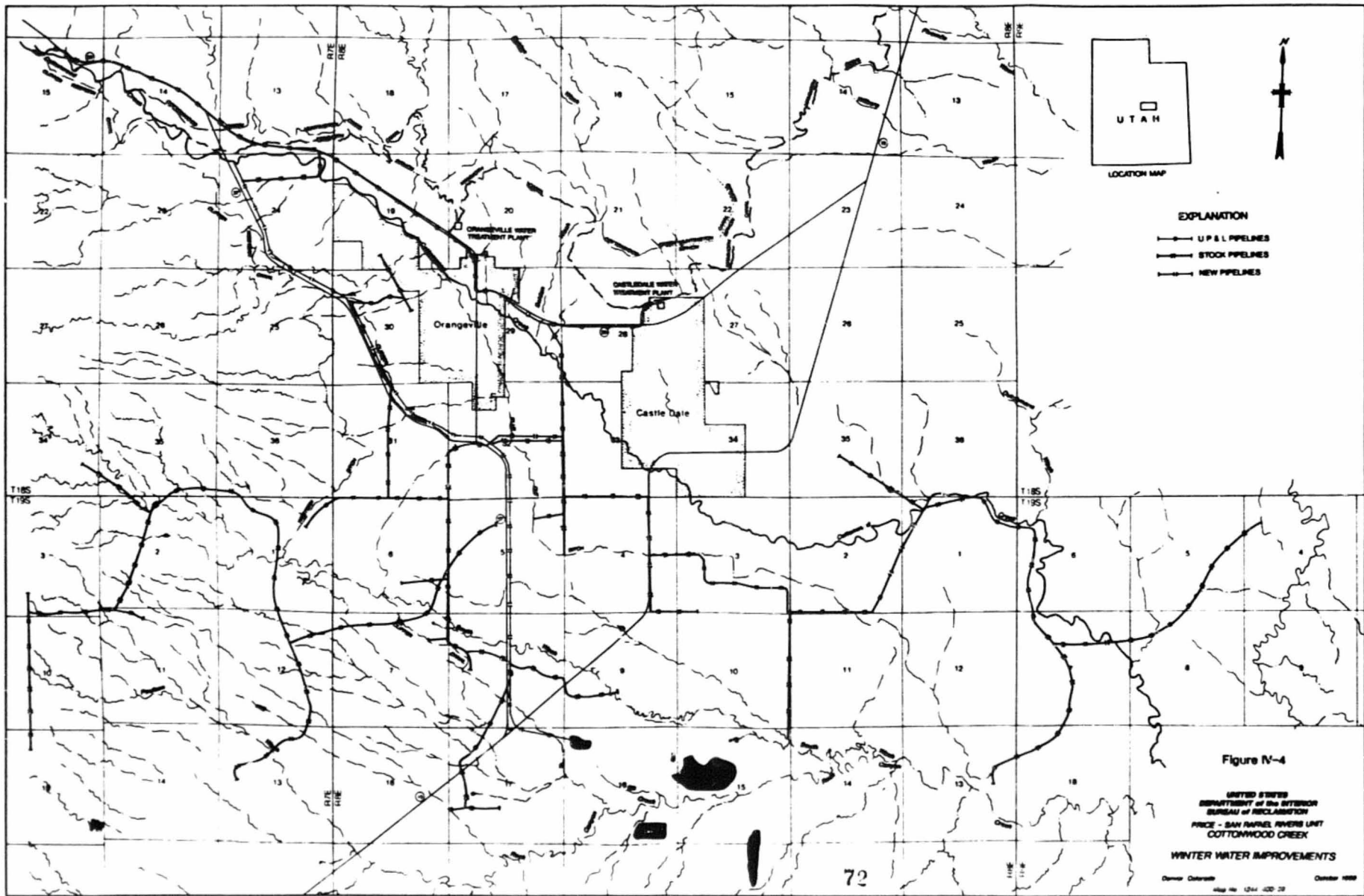
plant. Several interconnections would also be made with the existing livestock watering system to provide delivery of water at the required pressure. A total of 10.6 miles of pipe would be installed with diameters ranging from 21 inches to 4 inches.

Stockwater Ponds.—In remote areas, where no domestic water lines are in the vicinity, an estimated 83 stock ponds would be lined with a membrane liner. Each pond would be enlarged to an average capacity of 250,000 gallons, providing storage capacity equal to two times the projected winter livestock consumption. Fencing would be installed to prevent damage and contamination by livestock, and a remote outlet and automatic waterer would be provided. The ponds would be filled in October or early November, after which the canals would be shut off. Of the total of about 83 ponds to be lined, about half would be under each of the canal systems. A typical pond lining system is shown in figure IV-6.

Operation, Maintenance, and Replacement (OM&R) Irrigation Improvements.—

Off-farm Irrigation Improvements.—A summary of both the pre- and postproject annual operation and maintenance (O&M) costs for the sections of the off-farm system impacted by the alternative is found in table IV-2. The preproject costs are for expenses that would have occurred if a thorough and timely O&M program were carried out for the existing open lateral delivery system. Typically, the only maintenance that has been performed on the canals is the minimum required to keep flow paths open. This amounts to occasional removal of bedload deposition and vegetation within the channel.

With the off-farm improvements, major changes would be required in a thorough and timely O&M of an irrigation system. This is in order to ensure the continued integrity of the systems and the realization of identified salinity reduction benefits. The various canal companies would contract with Reclamation to operate and maintain the new piped lateral system to meet salinity program goals. As provided in Public Law 98-569 (October 30, 1984), Reclamation would reimburse these entities for O&M costs which exceed those that would have been incurred in the thorough and timely O&M of their systems without development of the unit. Detailed estimates of expected O&M costs with and without the unit would be determined during preconstruction activities in connection with involved entities. The canal companies would be responsible for repairing facilities associated with normal maintenance activities. However, they would not be responsible for major modifications, reconstruction of which became necessary through no fault of their own, or replacement of facilities which have served their normal useful life.



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TYPICAL CULINARY INSTALLATION

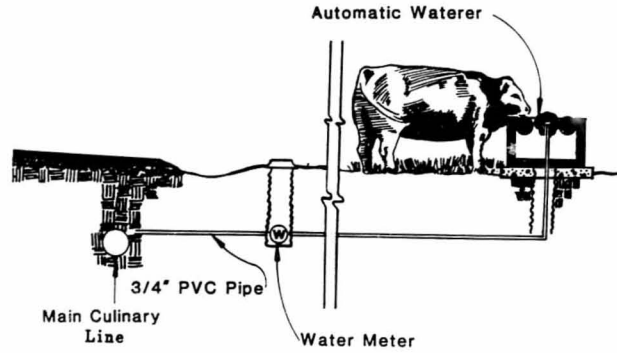


Figure IV-5

TYPICAL STOCKPOND INSTALLATION

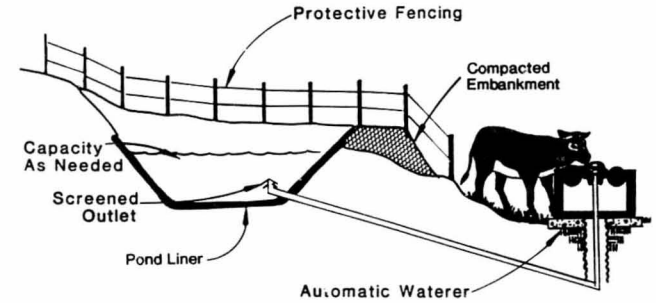


Figure IV-6

Table IV-2.—Off-farm O&M summary
RP plan

Increment	Subunit	Change in O&M
Irrigation improvement	Carbon	(\$19,742)
	Cottonwood	(11,829)
	Ferron	(17,140)
	Huntington-Cleveland	(12,869)
	Moore	(2,128)
	Price-Wellington	(18,086)
Totals		(\$81,794)
Winter water	Cottonwood Creek	\$ 0
	Domestic System Expansion (NEWUA)	16,520
	PRWID	5,775
	Stockwater ponds	9,940
	Totals	\$32,235

The cost for O&M of facilities put in place to mitigate for fish and wildlife impacts created by off-farm construction features was estimated at \$75 per acre of mitigation land purchased. The mitigation plan calls for a phased purchase of two 160-acre tracts plus a final purchase of 60 acres which would be used to develop 330 acres of mitigation wetlands. The percentage of total wetlands acres lost within each subunit relative to the total acres lost from the off-farm improvements determined the share of total O&M costs assigned each subunit.

Onfarm Irrigation Improvements.—Onfarm OM&R costs were estimated based upon the type of treatment to be applied. For surface treatment, the annual O&M was estimated at \$15 per acre and the replacement cost at \$9 per acre. For gravity sprinkler treatment, the cost was estimated at \$14 per acre for O&M and \$10 per acre for replacement. O&M costs for acreage requiring pump pressure to sprinkle was estimated to cost \$15 per acre for O&M and \$9 per acre for replacement. The cost for pumping is accounted for in a decrease of onfarm benefits calculated in the farm budget. All OM&R costs would be the farmer's responsibility.

Operation and Maintenance

Winter Water Replacement

Cottonwood Creek M&I Line.—The Orangeville and Castle Dale water treatment plants are owned and operated by the Castle Valley Special Service District. As the new Cottonwood Creek pipeline would supply water to these facilities, it is required that if Reclamation builds the pipeline, the Castle Valley Special Service District would provide the O&M for the pipeline.

Domestic Delivery System.—The addition of the 213 stock ponds to the domestic systems of the PRWID and the NEWUA would necessitate an increase in the O&M of these organizations. It is expected that these costs would be passed on to the stock pond users. Users of domestic water for stockwatering would be compensated for the higher unit cost of this water by a decreased water demand and, over time, lower O&M costs (as a result of irrigation improvements) passed on to the stockwaterer by the canal company from which they receive irrigation water. In the event that the irrigation improvement increment is not built, but the winter water increment is, Reclamation would subsidize the domestic delivery systems for the amount of their increased incremental O&M such that those costs would not have to be passed on to the stockwater users.

The estimated annual O&M cost increase due to additional winter water delivery for the NEWUA system is \$16,520, as shown in table IV-2. The estimated increase due to additional winter water by the PRWID is \$5,775. Mitigation O&M costs attributed to the domestic systems total \$420 per year.

Stockwater Ponds.—The O&M on the stock ponds is estimated to be \$100 per pond per year. These costs would primarily cover sediment removal, fence repair, and automatic waterer replacement. Total mitigation O&M costs attributed to stockwater pond lining are included in the \$100 per pond cost per year. For 83 ponds, the total O&M cost would be \$8,300 per year.

Fish and Wildlife Habitat Replacement

Off-farm Measures.—The plan developed for Reclamation's impacts to fish and wildlife from off-farm measures of the Price-San Rafael salinity control project is based primarily upon the estimated 330 acres of emergent and forested/scrub-shrub wetland losses, as shown on table IV-3. The Utah Division of Wildlife Resources (UDWR) has requested a one-for-one, in-kind mitigation for habitat losses, with development of fencing, access and water distribution systems, and ownership transferred to the State. UDWR would like to negotiate funding for O&M costs and has offered its services to assist

Table IV-3.—Estimated impacts and proposed mitigation measures for Reclamation's off-farm activities

Action	Acres		Mitigation
	Emergent	Wooded	
Irrigation wetlands eliminated			
• Price River basin			
Price-Wellington	15.5	9.6	
Carbon	24.8	10.6	
Cleveland	4.0	10.6	
• San Rafael basin			
Huntington	6.7	71.9	
Cottonwood Creek	0.6	44.5	
Ferron	8.6	44.6	
Moore	0.8	8.0	
• Stock ponds lined (83)	19.1		
• Stock ponds eliminated (213)	49.0		
• Total wetlands	130.1	200.8	330 acres of wetlands developed on 380 acres obtained in fee title
Upland disturbed			
• Pressurized pipeline	412		
• Cottonwood Creek water delivery system	45		
• Total upland	457		457 acres rehabilitated
Water depletions			
• Price River	-1,690 acre-feet		
• San Rafael River	-1,160 acre-feet		
• Total depletions	-2,850 acre-feet		Reclamation is exempt from depletion fees

in designing an appropriate configuration of wetland areas. One area being considered for mitigation is private landholdings in the Cottonwood Creek flood plain extending from the creek's confluence with the San Rafael River upstream to UDWR's existing landholdings near Castle Dale, Utah.¹ Other options include, but not be limited to, Desert Lake and the Three Forks area.

The emergent wetland vegetation losses associated with individual laterals and existing stock ponds would occur rapidly once water service is removed. Off-farm lateral ditches, however, would be taken out of service (abandoned) over an extended period since the USDA's portion of the program requires voluntary commitment to the program by individual farmers. Losses of forested/scrub-shrub wetlands would occur slowly because many of the woody plants are well established, and loss of seepage water would not cause their immediate death. The proposed plan would be accomplished incrementally, concurrent with project impacts.

Wetland wildlife habitat would be fully mitigated. Approximately 380 acres would be purchased, 130 acres of emergent wetlands and 200 acres of scrub-shrub/forested wetlands would be developed, and provisions would be made for the management of these resources for the life of the project. Although replacement acres would be separated and concentrated away from the individual impact sites, this arrangement should permit more efficient and effective management of mitigation lands.

Any large trees not directly affecting construction would be left standing. As dead or dying snags, these trees would provide perches for raptors and substrates for cavity excavators and ultimately secondary cavity nesters. Efforts would be taken to avoid disturbances to a golden eagle nest in the area; no disturbance would occur within one-half mile of the nest site from February through July. If disturbance to the nest could not be avoided, the nest or nest site would be moved as described under environmental commitments.

Under the Cottonwood Creek option, approximately 160 acres within the flood plain would be purchased from a willing seller along with 640 acre-feet of water rights (4 acre-feet per acre). A site-specific wetland construction design would be developed cooperatively with the UDWR that would include, but not necessarily be limited to, ditching, dikes, pothole development, shrub and tree planting, road access, and fencing.

Implementation of the site-specific plan would begin within 1 year of initial project construction. The plan would provide, when complete, at least 60 acres of palustrine persistent emergent wetlands managed to mimic, but not necessarily be limited to, the following water regimes: saturated, seasonally flooded, semipermanently flooded, and permanently flooded (Cowardin et al., 1979). In addition to emergent wetland, approximately 80 acres of forested/scrub-shrub wetlands would be created and maintained for the duration of the

¹ Letter from UDWR, March 21, 1988.

impact. This first phase of the plan would mitigate, on an approximate acre-for-acre basis, some 42 percent of the maximum estimated loss of wetland vegetation caused by stock pond lining and the proposed abandonment of additional ponds, laterals, and the Clipper Canal.

When additional impacts occurred, another 160 acres with water rights would be purchased and the cycle would be repeated with the same management goals as discussed above. A third purchase of 60 acres with water rights would be made, if needed. This final purchase, development, and management would mitigate for the remaining maximum estimated losses of wetland vegetation resulting from off-farm activities. Since it is unlikely that maximum losses would occur, the plan could be modified during the construction phase to more closely mitigate for actual losses.

Up to 457 acres of upland supporting salt-desert shrub vegetation would be used for borrow and disposal sites and work areas during construction of the proposed off-farm developments. Once work was completed, these areas would be recontoured to approximate the surrounding topography, topsoil replaced, and the areas reseeded with native plant seeds. It is estimated that treated sites would return to their original vegetated condition within 3 to 5 years. Rehabilitated areas along the buried pressurized pipelines would be reseeded after topsoil is replaced.

To resolve the controversy between water development and the protection of endangered fishes, a Recovery Implementation Program was developed by agencies and private concerns interested in the recovery of endangered fishes and the wise use of Colorado River resources. This program provides for water development interests to make monetary contributions on a per acre-foot basis to assist in the recovery of endangered fishes. In this manner, a jeopardy opinion³ is avoided, and continued water development is permitted. The money is used to fund research and for water acquisition and habitat management. Because of their participation and funding in the Recovery Implementation Program, Reclamation is exempt from these depletion charges.

Onfarm Measures.—Replacement of vegetation and wetland/wildlife habitat values impacted as the result of USDA onfarm activities would be voluntary, consistent with policies and other salinity control areas currently implementing the USDA Colorado River Salinity Control Program (CRSC). The Colorado River Basin Salinity Control Act, Public Law 93-320 as amended by Public Law 98-569; 88 Stat. 266, does not contain the word "mitigation." It does provide for the "... voluntary replacement of incidental fish and wildlife values foregone; ..." The USDA would consider all viable actions and make every effort when planning to encourage the individual landowner to preserve, maintain, enhance, or replace vegetation functioning as wildlife habitat.

³ A jeopardy opinion is a determination by the Fish and Wildlife Service that a given project may jeopardize the continued existence of an endangered species.

Wetland vegetation would be the most significantly adversely impacted resource if the preferred plan is constructed. The replacement of wetland/wildlife habitat with like habitat is a goal of the USDA in all its programs; however, the primary goal of the CRSC—to reduce salinity in the Colorado River—is not compatible with the preservation and/or replacement of wetlands supported by overirrigation. To reduce salt loading in the Colorado River resulting from seepage from irrigation ditches and irrigation, it would be necessary to reduce deep percolation and seepage, which have supported wetlands.

Salinity problems from onfarm sources are caused by excessive application of irrigation water (more than plant requirements) that percolates through the soil and dissolves salts. Ground water from deep percolation is the major source of irrigation-caused wetlands in the study area. The preferred plan would improve irrigation efficiencies, reduce deep percolation, and reduce the water available to support wetlands. The SCS has met with representatives from Reclamation, UDWR, the Environmental Protection Agency (EPA), and the Fish and Wildlife Service (Service) to discuss the alternatives for wetland vegetation replacement. However, physical limitations severely restrict replacement of wetlands in close proximity to irrigated areas.

Lined ponds or wetlands can be created in the shale members of the Mancos shale. However, these lined ponds would have no natural outflow because outflow to Mancos shale areas would contribute to the salinity problem. To prevent stagnation in livestock ponds, there would need to be a piped outflow to a point where the water could be consumed without resulting in deep percolation or could be returned to a natural water body. This design would increase cost and management problems and decrease wildlife habitat value because of the regular human disturbance that would be needed to check, maintain, and ultimately replace the lining.

Wetlands and/or ponds can be created in the soils formed in the sandstone member units of the Mancos shale (Emery Sandstone Member and Ferron Sandstone Member) without yielding salt. Each proposed site would be individually investigated with a backhoe pit or drill hole to 15 feet deeper than the proposed pond or wetland bottom to insure no sulphate salt problems will be encountered.

The role of the SCS is to provide technical assistance to the landowner to develop a plan that would improve irrigation efficiency and minimize environmental impacts. Cost-share money would be available to implement the plan; however, the landowners would be voluntary program participants, and management of the water would be under their control. Individual water users may apply to the State for the purpose of irrigating lands on their property for wildlife or waterfowl habitat.

USDA believes that voluntary habitat replacement within the Colorado River Basin Salinity Control Program will be successful in replacing wildlife values

foregone within the Unit. However, if monitoring indicates trends of lost wildlife habitat values, USDA will seek additional funding authority to assure replacement of these values.

A Local Salinity Coordinating Committee (LSCC) has been established to make recommendations for project implementation. The committee includes the SCS, Agricultural Stabilization and Conservation Service (ASCS), Reclamation, Extension Service, Farmers Home Administration (FmHA), UDWR, Utah Association of Conservation Districts, Price River Soil Conservation District, San Rafael Soil Conservation District, the Carbon Agricultural Stabilization and Conservation (ASC) County Committee, and the Emery ASC County Committee.

SCS is attempting to promote the highest level of habitat replacement by encouraging the LSCC to use a rating system to prioritize expenditure of cost-share monies, giving priority to those landowners volunteering to replace wetland/wildlife habitat. This system is used currently in the Uinta Basin Unit, Utah, where the rating system has resulted in a significant increase in planned application of wetland/wildlife practices. Before the start of the rating system, only about 15 percent of the individual salinity control plans per year contained wetland/wildlife practices; however, in 1989, when top priority was given to those planning for wetland/wildlife only, approximately 73 percent of the plans contained wetland/wildlife practices. The LSCC also can designate a specific amount of cost-share funds for wildlife habitat replacement.

The onfarm portion of this alternative would decrease return flow to the Colorado River System by 22,460 acre-feet annually. The SCS, Utah Department of Natural Resources, and local sponsors are currently working out an agreement with the Service to comply with the requirements of the Recovery Implementation Program for endangered fish species in the upper Colorado River Basin. The CRSC program is not exempt from the plan. Payment of \$10.91 per acre-foot to the Service for the average annual depletion caused by onfarm improvements would be made by an undetermined entity. The responsible party would be identified before construction began.

Procedure for Implementing Replacement of Habitat Values.—

Technical assistance on SCP's would be done on a farm-by-farm basis. An Environmental Evaluation (EE) would be completed on each farm during the planning process to document significant impacts to the resources and to ensure that the proposed alternative included all practicable measures to avoid or minimize impact to wetlands, wildlife, cultural resources, and riparian zones.

The following is the planning procedure used in developing the wetland/wildlife section of individual SCP's:

- *Inventory*—The wetland/wildlife habitat on each farm would be inventoried and a wildlife habitat map completed in the initial planning phases. This map would be a general inventory of land use and vegetative cover types that provide wetland/wildlife habitat.
- *Evaluation*—The SCS Wildlife Habitat Evaluation Guide would be used by planners (nonbiologists) to evaluate existing habitat, identify limiting factors, estimate impacts, document results, and plan for replacement of wetland/wildlife values.
- *Habitat Replacement Alternatives*—Alternatives would be developed to replace (in-kind) wetland and wildlife habitat values lost due to implementation of the salinity plan. When in-kind replacement was not possible, replacement with other types of habitat or enhancement of existing habitat would be presented to the landowner.
- *Priority Rating*—SCS assistance would be provided to program participants on a priority rating system similar to that already in use in the Uinta Basin Unit, Utah. Landowners who rated highest in attaining program goals (including replacing wetland/wildlife habitat) would receive a high priority for planning and cost sharing. One feature of the CRSC is the opportunity to cost share with an individual that requests assistance solely for wetland/wildlife development.

Private Land Opportunities.—The agencies involved in planning have discussed the alternatives of replacing and managing wetlands in areas not significantly impacted by the change in irrigation water supply. The flood plain associated with perennial streams provides the best opportunity. SCS would target information to owners of flood plain areas. If the landowner agreed to construction and/or enhancement of a wetland, SCS would promote wetlands having open water and a fringe of emergent vegetation. These areas generally have a higher value for waterfowl than the predominant extensive stands of wire grass/sedge. The section 404 permitting process and restrictions on water rights may restrict this activity. Most waterfowl prefer a complex of wetlands ranging from grass to open water. Most of the wetlands being converted have a majority of grass/sedge/saltgrass vegetation and few acres of open water. Therefore, most waterfowl, as well as muskrats, will be benefitted from pond construction. Open water with a fringe of emergent vegetation is more valuable than existing vegetation because it increases biodiversity compared to the existing grass/sedge/saltgrass wetlands.

It is estimated that 60 percent of the SCP contracts would contain some practices for wetland/wildlife habitat replacement.¹ The estimates are only for participation in the cost-shared replacement of wetland/wildlife habitat.

¹ The participation rate was developed from data from the Uinta Basin Unit.

No firm commitment can be obtained for the number of landowners participating or the amount and type of habitat replacement that would be installed. Each landowner would be informed, during plan development, of the amount and type of habitat impacted and would be given voluntary alternatives that would replace, to the extent practical, habitat values impacted by the planned activity. Landowners would need to apply to the Utah Division of Water Rights to irrigate lands for wildlife.

If annual reviews revealed that objectives for habitat value replacement were not being met, recommendations would be formulated by the LSCC to adjust the program. The CRSC law provides that if wetland/wildlife habitat replacement objectives are not being met at the existing cost-share rate, the rate can be increased.

Agency Habitat Replacement Opportunity.—Cost-share monies for wetland/wildlife habitat development on State-owned land within the area would be available to UDWR from USDA under the CRSC program. The cost-share rates and limits would be the same for wetland/wildlife habitat development as for irrigation system improvements. The UDWR has expressed interest in pursuing this alternative on land they own or that may be donated to them for this purpose or in conjunction with mitigation provided by Reclamation. If the CRSC is implemented, SCS will work the UDWR to develop and implement a plan and will help them identify additional sources of funds to cover development funds not covered by cost sharing.

Wetland/Upland Wildlife Conservation Practices.—SCS assistance can be provided for a single measure or combination of measures to preserve, maintain, enhance, and/or develop wetland and/or upland wildlife habitat through the following: dikes, farmstead windbreak, fencing, field border, fish windbreak, fish pond management, fish stream improvement, hedge row planting, pasture and hayland planting, proper grazing use, range seeding, tree planting, wildlife upland habitat management, wildlife watering facility, and wildlife wetland habitat management.

The areas of wetland/wildlife habitat developed would generally be smaller in size than the original habitats but would provide more diversity. The most common type of wetland areas created by the CRSC program would be in conjunction with ponds (shallow open water areas with a fringe of emergent vegetation). The existing wetlands that remain after irrigation system improvement would continue to provide the same values as they do now, but some would be smaller due to receiving less irrigation water.

Some types of upland habitat would be reduced in acreage, as detailed in chapter V, but upland habitat maintenance and/or replacement would generally provide equal or higher value for species occurring in these habitats. The 1978 UDWR report (Dalton et al.) stated that the alfalfa fields with associated fence rows, ditch banks, trees, and shrubs have the highest diversity of avian and

mammalian species; therefore, as part of the SCS planning assistance, the landowner would be encouraged to leave, where possible, existing fence row and ditch bank vegetation adjacent to irrigated fields. These areas could be fenced and managed as part of the CRSC program.

Replacement areas would generally be of higher value because plant species would be selected to maximize benefits to wildlife species and the areas would be fenced and managed for wildlife. Although site-specific significant impacts to upland wildlife habitat could occur, the overall impacts would not be significant because the area would retain the current, irrigated agriculture-associated habitats.

Cultural Resources

Both Reclamation and the SCS acknowledge their responsibility for the identification and protection of cultural resources (*Reclamation Instructions*, section 376.11; *SCS General Manual* 420 part 401.2). Consultation with the State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), Native American cultures, or other concerned individuals and agencies would be conducted according to prescribed procedure as circumstance requires.

Onfarm Measures.—The SCS would consult with the SHPO as each landowner applied for assistance. Cultural resources identified in consultation or during program implementation would be treated according to SCS policy and procedure (*SCS General Manual* 420 part 401.7; 401.9).

Although there are no definite guidelines that provide for the disposition of paleontological resources on privately controlled lands, the SCS strives to protect these irreplaceable resources by encouraging landowners to seek proper assistance from professional sources. The SCS helps coordinate landowner and professional concerns, if requested to do so.

Off-farm Measures.—Consultation with the Utah SHPO was initiated January 31, 1989, and would be coordinated with the ACHP to examine the project impact on sites determined eligible for the *National Register*. As of April 1991, seven historic irrigation ditches were in the process of nomination to the *National Register*. Mitigation of adverse effects on eligible archeological sites would include excavation for data collection, documentation, and preservation. Mitigation of eligible historic sites would consist of documentation in accordance with the standards of the Historic American Building Survey - Historic American Engineering Record. Such documentation would include an historic overview, detailed descriptions, and archival quality photographs of each eligible site. Further, construction specifications would contain the requirement that contractors watch for subsurface cultural resource material

during construction activities. Should cultural resource items be discovered during construction, contractors would be required to cease work on such locations until a qualified specialist had evaluated the findings.

NED Alternative

This alternative was formulated to provide the least cost-per-ton of decreased salt loading while still meeting all four tests of viability. The combined cost effectiveness of the NED alternative is \$33 per ton. This alternative removes 147,600 tons of salt per year.

The NED alternative is identical to the RP alternative except it does not include improved surface irrigation, as shown in table IV-4. The NED alternative includes the installation of combined SCS and Reclamation sprinkler irrigation systems (including piped laterals), improved irrigation water management, and the elimination of water from all open conveyance systems in the project area during the winter (nonirrigation) season.

Table IV-4.—Irrigated acres
(average water year)

Viable plans	No action	(NED) Sprinkler only	Sprinkler and surface (RP)
Gravity sprinkler	0	16,350	16,350
Pumped sprinkler	0	9,650	9,650
Improved surface	0	0	10,050
Presently treated			
Gravity sprinkler	1,140	1,140	1,140
Pumped sprinkler	200	200	200
Not treated or participating	<u>43,940</u>	<u>17,940</u>	<u>7,890</u>
Total acres irrigated in an average year	45,280	45,280	45,280

Under this alternative plan, about 16,350 acres would be treated with gravity-pressure sprinkler systems, with irrigation water management; 9,650 acres would be treated with pump pressure sprinkler systems, with irrigation water management, for a total of 26,000 acres. About 1,340 acres are presently treated with sprinkler irrigation, and 17,940 acres would not be treated or are irrigated areas that are not impacted by the project because the owners are not participating.

The sprinkler irrigation systems improvements would involve, but are not limited to, diversion works from main canal systems, off-farm buried pipe laterals, onfarm buried pipes, pumps, motors, sprinkler systems, and off-farm buried pipe laterals that would provide gravity pressure to the onfarm system.

Technical and cost-sharing assistance would be provided to individual water users, irrigation companies, and groups to install needed system improvements. Technical assistance would be provided to improve irrigation water management skills of water users. The assistance would include working with irrigation companies to improve management of irrigation water delivery and, in some cases, assisting them in converting from a fixed-schedule delivery to demand delivery of irrigation water. This would allow the water user to order water when needed. Also, one-on-one assistance would be provided to each water user to evaluate and modify present irrigation methods and other management practices to achieve improved irrigation efficiencies and improved resource management skills, including those needed for wildlife habitat, pasture, cropland, and rangeland.

About 27,340 acres would be irrigated at an irrigation efficiency of 60 to 65 percent.⁴ These acres include the 1,340 acres already treated for sprinkler irrigation in the project area. To help achieve these irrigation efficiencies, an irrigation water management plan would be a part of this alternative. The estimated 17,940 acres that would not participate in the project would be irrigated, but at an efficiency of 35 percent or less.

In order to implement and operate an effective basinwide irrigation water management program, this alternative plan would include localized climatological data collection sites so that this information would be available for determining how much water to apply and when.

No Action Alternative (Future-Without-Plan Condition)

The no action alternative is presented to identify future conditions in the project area without either of the viable plans. Under this alternative, no additional onfarm or off-farm salinity control measures would be introduced by

⁴ Irrigation efficiencies of 60 to 65 percent have been achieved with sprinkler irrigation in many instances over the past several years in similar locations, including some within this basin, as documented by SCS.

Reclamation and/or the USDA, and this baseline serves as a foundation for determining the effects of the viable plans. The core purpose of this comparison is to reveal and eliminate any overlapping features in order to avoid redundant expenditures and to forestall credit given the project for effects attributable to another source.

The no action alternative is not necessarily an extension of present conditions into the future. The primary difference between the estimated future conditions without the plan and those conditions which currently exist in the project area is the result of water rights owned by Utah Power and Light Company (UP&L). In an average year, UP&L's water right yields 48,400 acre-feet of water, and at present it is using about 35,000 acre-feet for cooling. In normal or above normal water years, UP&L leases back to the irrigators about 13,400 acre-feet. If, in the future, UP&L constructs other power units, or if due to drought the company needs to use all of its water rights, there would not be water to lease to area landowners.

The difference between UP&L using all of its water right and leasing back 13,400 acre-feet is as follows:

- A reduction of about 3,630 irrigated acres.
- About 2,000 acre-feet of water that would have returned to the area creeks will be consumed.
- About 500 acres of wetland may be changed to upland.
- Salt loading to the Colorado River would be reduced by 9,500 tons.

No lands under consideration for treatment under the alternatives currently receive water that is leased from UP&L; therefore, the above impacts are assumed to have occurred in the no action alternative.

Onfarm

The no action alternative would reflect a continuation of presently ongoing conservation programs which includes implementation of the Food Security Act (FSA).⁵ The three main components of the FSA are the Conservation Reserve Program (CRP), Highly Erodible Land Conservation (HEL), and Wetland Conservation (Swampbuster).

⁵ The legal authority for the SCS policy and procedures for implementing the FSA are contained in Public Law 99-198 (16 U.S.C. 3801 et seq.), (Title 12 and 13) the FSA of 1985. The SCS final rule is contained in 7 CFR 12, September 17, 1987, as amended.

There are no CRP contracts written in this project area, and none are known to be currently eligible. The objectives of the HEL and wetland (Swampbuster) conservation provisions are to remove certain incentives for farmers to produce agricultural commodities on highly erodible land or converted wetland.

The SCS makes technical determinations as to whether a field is highly erodible or a wetland. SCS provides technical assistance to landowners to develop conservation plans on HEL land. SCS provides information to landlords to avoid impacts to natural wetlands to maintain eligibility for government programs.

Under the no action alternative, conservation activities would continue at a rate influenced by the amount of funds available through government cost-share assistance programs, practices eligible for cost-share assistance, the financial resources and desire of landowners to implement irrigation water management or other management practices, and the quantity of technical assistance available through government agencies. As stated above, a small amount of land now being leased from UP&L would become upland.

For the last several years, 900 to 1,200 acres have been treated each year by concrete lining earth ditches or replacing them with gated pipe. Because of a low cost-share rate, per-acre dollar limitation, and lack of funding, no land leveling is being done. For those reasons, plus the inability to fund group laterals that would provide gravity pressure, no sprinkler systems are being installed. As a result, irrigation efficiency resulting from these improvements is increasing from about 20 percent to between 30 and 35 percent. Thirty-five percent is the assumed average irrigation efficiency with the no action alternative.

The ongoing soil and water conservation program is funded by cost-share assistance of about \$50,000 annually, administered through the ASCS and the ASC County Committee system in Carbon and Emery Counties. These funds would be used mainly to install onfarm irrigation water distribution pipelines on individual farms. Technical assistance would be provided through the Price and San Rafael Soil Conservation Districts (SCD's) by the SCS.

With the exception of the changes brought on by the permanent withdrawal of UP&L water, conditions under this alternative would continue virtually unchanged. Since the introduction of irrigation in the study unit, there has been a gradual loss of crop production to salt buildup in the soil and waterlogging and a corresponding shifting of fully irrigated land to partially irrigated land. Using present irrigation methods at present levels of efficiency, this trend would continue on susceptible acreages.

Since the introduction of irrigation into the unit, the phreatophyte community has flourished, providing habitat for a variety of wildlife species. Under a future without project plan, these habitat communities would continue at existing levels or slightly decrease due to slightly increased irrigation efficiencies.

Industrial Development

Salinity impacts of industrial development other than UP&L could occur over the next 25 to 30 years, particularly in the area of power generation, regardless of whether there is a federally funded salinity project. The impact these developments could have on the salinity of the Colorado River is dependent upon the source of water and timing of development. Without a federally assisted project, relatively fresh water would probably be used in such developments, and the timing for the developments would depend upon economic conditions and would be accelerated, delayed, or eliminated in response to the fluctuating economy.

Socioeconomic Trends/Land Use

The 1988 baseline projections published by the Utah Office of Planning and Budget indicate that the populations of Carbon and Emery Counties should remain fairly stable through the year 2010. Therefore, population growth is not expected to cause land retirement or place a significant strain on housing, community infrastructure, schools, or other human services.

Most of the nonmining, energy industry-related workers are expected to locate in the Price area, with Price remaining the highest-order trading center for the two-county region. Price is also expected to house perhaps as many as a third of the coal miners working in the Emery County coal fields.

Values and Attitudes

The dominant social character of the Price-San Rafael River basins area is expected to remain tied to mining and agriculture. The combined total land in farms in Carbon and Emery Counties consists of nearly one-half million acres, with about 47,986 irrigated acres. The irrigated acreage of the area without plan development is projected to be 45,280 acres. The availability of large acreages of pasture is conducive to livestock operations, which are projected to continue to be the predominant agricultural enterprises in the area.

While the number employed in mining (2,317) exceeds the number engaged in farming⁶ (656) several times (see table IV-5), local residents view the area as a farming community. Mining and agriculture provide an important and sustainable employment base of the area. It is not likely to expand in the future, but will remain relatively stable.

⁶ Census of Agriculture - 1987.

⁷ Source: SCS.

⁸ See table IV-9.

Table IV-5.—Employment (1989)¹—major business sectors
production-oriented sectors

Sector	County		Total
	Carbon	Emery	
Mining	1,272	1,045	2,317
Farm operators	210	446	656
Construction	189	287	476
Manufacturing	287	14	301
Product distribution and service-oriented sectors			
Retail	1,208	317	1,525
Services ²	1,189	226	1,415
Transportation and public utilities	301	750	1,051
Wholesale	243	10	253
Finance, insurance, and real estate	172	40	212

¹ Utah Labor Market Report (March 1990).² Services as a subgroup within service-oriented businesses include: lodging places, personal services, miscellaneous repair services, health services, social services, and membership organizations.

Product distribution and service-oriented businesses are dependent on the activity generated by the production-oriented industries shown in table IV-5. These businesses will thrive and decline along with the success and failure of the production industries. Consequently, local residents identify with the industries and businesses which provide the basic character of the area.

Major production-oriented business sectors of the study area rank in importance as follows: mining, farming, contract construction, and manufacturing. Area

residents have a strong preference to stabilize the role of agriculture, especially among the communities along the eastern slope of the Wasatch Mountains in Emery County.

Data on tourist trade in the area are limited. However, local planners will place increasing emphasis on promoting local tourism in the future to assist in stabilizing employment opportunities as the activity in other sectors fluctuates.

If employment in mining, construction, and manufacturing in the study area declines in the future, the exodus of workers from the area will not be as dramatic as might be expected since many are engaged in farming as well. Many of these workers will remain in the area and continue their farming operations because they have a strong attachment to agriculture. It is this attachment to the land which nurtures their self-perception as an agricultural community.

Most individuals engaged in agriculture in the area receive benefits from this lifestyle that cannot be quantified in economic terms. Also, the area has a firmly established tradition of strong core-family and community cohesion. Residents are willing to forego living in the metropolitan areas to rear their families in a familiar and rural setting.

Nonviable Alternatives

For each of the above alternatives, the SCS or Reclamation developed appraisal-level designs, cost estimates, and estimates of impacts. The four tests of the *Principles and Guidelines*—completeness, acceptability, efficiency, and effectiveness—were then applied to each alternative. The alternatives discussed below were found to be nonviable because of failing one or more of the four tests.

Improved Surface Irrigation

This alternative plan would emphasize improving the water user's skills in using available water and water conveyance and application facilities. Some structural measures would be included to improve distribution of water being delivered and used onfarm.

The improved surface irrigation system would involve a range of improvements to onfarm facilities. Onfarm improvements would include those practices necessary to achieve program efficiency goals of 50 to 55 percent for flood irrigation. These practices could include all or only a few of the following irrigation improvement treatments: water measuring devices, water control structures, land leveling, pipelines, gated pipe, borders, automated water control valves, tail water recovery systems, and irrigation water management.

This alternative has an estimated cost effectiveness of \$106 per ton, which fails the efficiency test. The plan is not effective; an alternative made up entirely of surface irrigation would not be feasible for areas of rolling topography and shallow soils, and because not enough reduction of salt loading would occur. It also was not acceptable to many local farmers, and, as a result, would have a low participation rate, significantly reducing its effectiveness. The plan was therefore considered nonviable.

Retirement of Land from Irrigation

This alternative, considered by both Reclamation and the SCS, would eliminate irrigated agriculture while maintaining flows in the system of canals and ditches and supplying Desert Lake and Olsen Reservoir; it would involve the purchase of all irrigation water rights and existing distribution systems. Approximately 20 percent of the water would still be diverted into the ditches, and 80 percent of the current irrigation water would flow by the diversion and be used for industrial purposes. This would maintain strips of existing vegetation (grasses, forbs, shrubs, and trees) adjacent to the delivery system and return flow areas.

This alternative provides the potential for the greatest decrease in salt loading to the Colorado River System but did not meet the four tests of viability. It was not feasible due to cost (estimated at approximately \$200 per ton) and social acceptability, and it was not implementable under current State policy.

Potential industrial users for this water have no concrete plans to develop facilities that could make use of this water in the future; therefore, there is not another beneficial use for the water.

Drainwater Usage

Cooling.—UP&L currently operates the Hunter and Huntington Powerplants with a total combined capacity of five 400-megawatt (net) generators in the San Rafael River basin. Future generation capacity at the turn of the century or later could be provided by a powerplant near Wellington.

This alternative envisions collecting, storing, and transporting agricultural return flow from the Price River basin for cooling the proposed powerplant by using binary cooling towers (BCT). To provide design data and operating experience, Reclamation attempted to negotiate with UP&L to have a jointly funded BCT demonstration plant built at Hunter. However, due to problems with the technology of BCT, no agreement was established, and the company promoting this technology has since gone out of business.

The cost effectiveness of the alternative was estimated to be from \$19 to \$24 per ton, depending on the size of the facility. This cost does not include the cost to industry for construction of the binary cooling towers, and it would be

expected that industry would want to negotiate some Federal cost sharing. The alternative fails the completeness test as the technology has not been successfully demonstrated or developed for commercial application.

Treatment or Disposal.—Eight possible area drain collection systems are proposed, four each in the Price and San Rafael River basins. In the Price River basin, an average annual flow of about 34,500 acre-feet per year and a salt load of approximately 166,900 tons per year are released from drains, and in the San Rafael River area, an average annual flow of about 20,100 acre-feet per year and a salt load of approximately 71,900 tons per year are released from drains.

Two different schemes, evaporation or desalination, have been developed for disposing of the drainwater. The cost effectiveness for these two options ranges from an estimated \$130 to \$640 per ton, so the plans fail the efficiency test. Further, they are not acceptable to the State of Utah, which desires that the waters be used beneficially.

Other Industrial Use.—The use of drainwater for tar sands development, coal processing, or coal slurry transport could occur at some time in the future, but when these developments might begin is highly speculative. Further development is dependent on a wide variety of factors, including the occurrence of higher oil prices than at present, a Federal price support policy, development of appropriate technology, acceptable resolution of environmental concerns, and water availability.

It is estimated that with full development, 14,100 acre-feet of drainwater could be used for tar sands development, 1,100 acre-feet for coal processing, and 5,100 acre-feet for coal slurry. Cost effectiveness for this alternative ranges from \$59 per ton for the tar sands plan to \$179 per ton for the coal slurry plan.

However, this alternative is not complete, in that none of the potential industrial users of drainwater—tar sands, coal processing, and coal transportation ventures—have concrete plans for actual development or use of saline water. It is therefore considered to be nonviable.

Selective Withdrawal

The selective withdrawal options would remove brackish water from the Price and San Rafael Rivers according to varying levels of water quality selected, and would then dispose of the water by evaporation or by treating the water by desalination. Overall, 12 different options were examined (6 in each river basin).

The most cost effective of the selective withdrawal options would be to divert all flows on the Price River having TDS concentrations above 2,400 milligrams

per liter and treating by desalination. The cost effectiveness of this option would be \$216 per ton, and the salt load reduction would be approximately 148,200 tons per year. This fails the efficiency test and is considered nonviable.

Canal Lining

Canal lining was originally part of the recommended plan presented by CH₂M-Hill for salinity reduction in the Price and San Rafael River basins. Based on the results of ponding tests, figures used to estimate canal seepage were reduced to about 13 percent of original estimates. This decrease in canal seepage increased the cost per ton of salt saved from about \$40 per ton to \$300 per ton for the Price River basin and from about \$45 per ton to more than \$300 per ton for the San Rafael River basin. At these increased cost levels, canal lining fails the efficiency test and is therefore nonviable.

PLAN SELECTION

As noted at the outset of this chapter, viable plans are tested further through four principles and guidelines—mandated accounts that measure the plan's potential impacts on: national economic development, regional economic development, environmental quality, and social effects. The following section presents these four accounts for the viable alternatives and no action plan.

National Economic Development Account

The NED account is used to measure all economic project impacts to the Nation. NED costs for salinity projects are the same as the total project costs. NED benefits include benefits to Lower Basin water users, measured by reduced salinity in the lower main stem. Direct benefits are shown in the NED account. The 1989-level value of salinity reduction, \$51.33 per ton, is based on Alan Kleinman's and Bruce Brown's *Colorado Salinity - Economic Impacts on Agricultural, Municipal, and Industrial Users* published in December 1980, by Reclamation. The 1976 figures were updated to 1989 levels using the Gross National Product Implicit Price Deflator Index. Additional information on the value of salinity is included in attachment VI of this report.

The NED account displayed in table IV-6 shows the combined beneficial, adverse, and net beneficial effects for the action alternatives. The RP alternative includes the combined USDA-Reclamation sprinkler irrigation system, improved surface irrigation, onfarm irrigation water management, and winter water replacement. The NED alternative is identical to the RP alternative except that the RP alternative includes improved surface irrigation. The amounts shown in the NED accounts for the NED and RP alternatives reflect the plan formulation and evaluation interest rate of 8-7/8 percent which is the interest rate for fiscal year 1990.

Table IV-6.—National economic development account for NED and RP plans
Price-San Rafael
(average annual amounts)

	Average annual values	
	NED plan	RP plan
A. Beneficial effects		
1. Value of goods and services		
a. Onfarm benefits	\$1,756,010	\$2,031,620
b. Downstream benefits	<u>7,576,310</u>	<u>8,266,180</u>
Total beneficial effects	\$9,332,320	\$10,297,800
B. Adverse effects		
1. Implementation cost ¹		
a. Project installation	\$4,824,640	\$6,046,000
b. OM&R	624,000	869,040
c. Monitoring and evaluation	118,170	118,170
d. Technical assistance	219,890	431,820
e. Habitat replacement	149,400	207,130
f. Streamflow payment depletion	0	0
g. Project administration	199,290	391,350
h. Public information	<u>35,000</u>	<u>35,000</u>
Total implementation cost	\$6,170,390	\$8,098,510
C. Net beneficial effects	\$3,161,930	\$2,199,290

¹ Cost amortized at 8-7/8 percent for 50 years. February 1989 price base.

In recent years, Reclamation has evaluated the technical adequacy of an updated salinity benefit model. Preliminary results show that direct salinity benefits may be as high as \$295 per ton by year 2010, expressed in 1989 dollars. This per unit value assumes that the salinity control program is fully implemented by year 2010. Reclamation has adopted the new value on an interim basis, in lieu of the above value from the Kleinman and Brown model, pending further review. However, SCS has not reviewed the model in sufficient detail to accept the value for use in project justification. Therefore, the updated salinity value is not displayed in table IV-6. It should be recognized, however, that benefits may be significantly understated.

Regional Economic Development Account

The RED account registers changes in the distribution of regional economic activity that result from each alternative plan. The regions used for Reclamation's RED analysis are those regions within which the plan will have particularly significant income and employment effects. The "adjacent region" in the RED account for salinity studies indicates the impact on users of the Colorado River downstream from the region of impact. Reimbursable and nonreimbursable amounts, in accordance with the provisions of Public Laws 93-320 and 98-569, are displayed in table IV-7.

Environmental Quality Account

The EQ account for the Unit is displayed in table IV-8. The table summarizes the impacts of the NED, the RP, and no action alternatives. A detailed analysis has been included in chapter V for the environmental factors identified as being significantly impacted.

Construction of the Unit would result in negative environmental impacts to wildlife/wetland habitat. These concerns and others, including possible impacts to native fishes, are discussed in chapter V.

The SCS predicts impacts to occur to wildlife/wetland habitat currently associated with inefficient irrigation practices. Because landowner participation in the project would be voluntary and therefore difficult to anticipate, the SCS has adopted a worst-case approach to impact assessment.

Social Effects Account

During the process of analyzing the social implications of each issue or concern, its relative significance in the decisionmaking process is evaluated. Those social issues which influence the course of action by decisionmakers are presented in the social account. The SE account includes a summary of the impacts associated with the social issues and a discussion of the social acceptability of the three viable plans.

While many of the impacts of developing the Unit would accrue to the immediate project area, downstream water users would benefit from the improved water quality. Participation in the project would be voluntary, and while initial local interest was high, no precise list of participants has been developed.

Implementation of the NED or RP alternative would affect the traditional irrigation practices to which the irrigators are accustomed. Such factors as timing and duration of water application, level of skill required in operating

Table IV-7.-RED account winter water plan and off-farm irrigation improvement (annual monetary impacts in \$1,000)¹

	Impacts (in \$1,000) ²			
	Region	Adjacent region ³	Rest of Nation ⁴	NED
Beneficial				
Value to user				
Direct	\$ 0	\$2,095	0	\$2,095
External economies	0	0	0	0
Unemployed resources	31	0	0	31
Increases from plan services	0	0	0	0
Construction benefits ⁵	1,424	0	-1,424	0
Incremental OMR&E ⁶ salaries	0	0	0	0
Contractor's purchases	337	0	-337	0
Total beneficial effects	\$1,792	\$2,095	-\$1,761	\$2,126
Adverse				
User payments-basin funds ⁷				
Investment costs		-928	0	-928
OMR&E	0	0	0	0
Nonreimbursed by Upper and Lower Colorado basin funds				
Investment costs	0	0	-2,167	-\$2,167
OMR&E	0	0	0	0
External diseconomies				
Displaced resources	0	0	0	0
Loss in welfare payments	-3	0	3	0
Total adverse effects	\$ -3	-\$ 928	-\$2,164	-\$3,095
Net beneficial effects	\$1,789	\$1,167	-\$3,925	-\$ 969

¹ Reclamation and SCS RED accounts are not the same. SCS' computation is included in attachment VI.

² Annual values in 1989 dollars.

³ Adjacent region refers to users of the Colorado River downstream from the region of impact.

⁴ Rest of Nation refers to the rest of the State of Utah and all other States of the United States.

⁵ Includes direct construction salaries plus gross output multiplier effect (indirect earnings).

⁶ Operation, maintenance, replacement, and energy.

⁷ Fiscal year 1990 repayment interest rate for the Colorado River Basin Salinity Control Act is 8-1/8 percent, 50-year repayment period. Thirty percent is reimbursable from the Upper and Lower Colorado River Basin Funds (Public Law 98-569).

Table IV-8. Environmental impacts

Environmental component or resources	Description of impact				
	NED plan		Recommended plan		
	Off-farm	Onfarm	Off-farm	Onfarm	No action
Water quality:					
Salt loading (tons)	—	¹ 96,410	—	¹ 82,960	244,000
Water quantity:					
Acres with water rights	0	66,450	0	66,450	66,450
Acres treated	0	26,000	0	36,050	0
Diversion (acre-feet)	0	178,100	0	178,100	178,100
Farm delivery (acre-feet)	0	140,140	0	142,130	136,200
Deep percolation (acre-feet)	—	40,030	—	36,960	64,670
Depletion (acre-feet)	2,850	19,560	2,850	22,460	2,000
Crop consumptive use (acre-feet)	0	77,800	0	82,070	54,170
Deep percolation return flow		28,010	—	26,020	54,690
Air quality:	Negligible short-term local adverse impact during construction		Negligible short-term local adverse impact during construction		No impact
Visual quality:	Locally adverse impact from loss of trees within salt-shrub desert		Locally adverse impact from loss of trees within salt-shrub desert		No impact
Biological resources:					
Vegetation ²					
Cropland (acres actively farmed out of total 66,450 acres)		59,133		61,311	55,357
Upland disturbed (acres)	457	25,998	457	30,050	0
Wetlands (emergent) (acres)	³ 330	7,360	³ 330	7,010	11,439
Riparian tree/shrub/scrub (acres)		2,846		2,789	3,620

¹ Total for both off-farm and onfarm loading.

² Includes only wetlands within the proposed project area.

³ Includes 130 aggregate acres of palustrine emergent wetlands and 200 aggregate acres of forested and scrub-shrub wetlands if the off-farm component of either action alternative were fully implemented.

Table IV-8.—Environmental impacts (continued)

Environmental component or resources	Description of impact				
	NED plan		Recommended plan		No action
	Off-farm	Onfarm	Off-farm	Onfarm	
Biological resources (continued):					
Wildlife	Impacts commensurate with habitat changes		Impacts commensurate with habitat changes		No impact
Fish species	Unknown		Unknown		No impact
Endangered species	Depletion of water may affect endangered fish. Offset by depletion payment		Depletion of water may affect endangered fish. Offset by depletion payment		
Cultural:					
Archeological	Unknown		Unknown		No impact
Historical	Unknown		Unknown		No impact
Recreational:					
Fishing	No significant impact		No significant impact		No impact
Camping	No significant impact		No significant impact		No impact
Hunting	No significant impact		No significant impact		No impact

and maintaining the systems, and initial investment are among the issues irrigators would consider in evaluating the acceptability of the proposed measures.

Federal cost sharing of onfarm conservation measures is available via ASCS, with the SCS providing technical assistance. The winter water service systems would be constructed by Reclamation with Federal funds. Consequently, cost is not a highly significant concern among the local participants. However, the cost of the unit is shared with the Colorado River Basin States of Wyoming, Colorado, Utah, New Mexico, Nevada, Arizona, and California. This cost share amounts to 30 percent of the project cost. The Basin States and the Federal Government are seeking the most cost-effective approach to reducing salinity in the Colorado River Basin.

Several issues are of immediate concern to local participants and other parties interested in reducing the area contribution to the total salt load in the Colorado River System. The following issues or factors were used in comparing the study alternatives.

Priorities are for developing winter service systems for local domestic water users, identifying participants for implementing onfarm salinity reduction measures, and developing methods of accomplishing off-farm salinity reduction measures. Local residents whose winter water facilities would be modified are interested in the process of developing priority schedules for constructing these facilities. This may include resolving problems associated with negotiating agreements with the domestic suppliers. When the plan designs are completed, the participants would have the opportunity to evaluate their reasonableness and review the logic of the construction schedule and the order of development.

Winter water prioritization and user participation were combined into one social factor. Water user participation is voluntary, but the actual number of participants should be optimal if the ultimate potential of each action alternative is to be achieved.

The no action alternative would allow 244,000 tons per year of salt loading to continue, as this plan includes no improvements. The NED alternative would reduce the area contribution to 96,400 tons (reduction of 147,600 tons), and the RP alternative would reduce the contribution to 83,000 tons (reduction of 161,000 tons) each year after the project improvements were in place. Downstream water users would benefit from the reduction in salt loading in the Colorado River System. The RP plan would reduce salt loading by about 14,000 tons per year more than would the NED plan.

The high level of interest in developing salinity reduction measures in the project area has prompted the project sponsors to seek the most efficient and cost-effective methods and procedures for resolving the salinity problems. The construction and replacement costs of the winter water modifications and the off-farm measures would be repaid from the Upper and Lower Colorado River

Basin funds without local cost which should enhance local acceptability. The farmer would pay 30 percent of the onfarm facilities. Project cost is the unit of measurement for this factor.

Each action plan would convert some acreages from wetlands—onfarm and off-farmed fields—to cropland or upland as a result of improved irrigation efficiency. The RP plan would convert about 5,590 such acres while the NED plan would convert 5,180 acres. Acres converted were used as the unit of measurement for this factor.

The impacts from construction of the off-farm portion would create about 725 work-years of employment (direct plus indirect) over the 11-year construction period with the RP and NED plans, while the no action alternative would generate no new revenues or jobs for the local economy. The new employment would contribute about \$1.8 million annually (50-year annual equivalent) to the local economy in salaries and wages. Total number of jobs was used as the unit of measurement for this factor.

Table IV-9 indicates the way in which these factors were ranked by local water users and irrigators and by salinity interests, including downstream users.

The numbers shown for each factor in the tables reflect the portion of the decision that was assigned to that factor. The tabulation is a discussion of values and attitudes which prompted the weighting used in each evaluation.

As shown in tables IV-9 and IV-10, the social analysis, based on the local perspective of water users and that of the salinity interests, indicates that the RP plan is the most socially desirable plan and would serve the objective of the study, based on information from meetings and contacts with the sponsors and interested parties. The evaluation termed "Water Users" was conducted with weighting of factors reflecting the preferences of the local irrigators and water users, and the social factor of the evaluation "Salinity Interests" was weighted to indicate the priorities of the salinity interests and downstream users.

The total scores for each plan derived by information from the water users and salinity interest groups are not identical, but the trend is the same. The relative range of the scores indicates the level of preference; the desirability scores ranged from 10 to 85, with a potential range of 0 to 100. The level of preference indicated by the relationship among these numbers is more important than the value of the numbers themselves.

As shown in table IV-10, the RP plan is viewed as the most acceptable plan based on the analysis of social concerns. The Multi-Attribute Tradeoff System (MATS) computer program was used to compare the alternatives using the five social factors reflecting the concerns of local publics as expressed at public involvement meetings, team meetings, and in interviews with key community leaders by an SCS and Reclamation study team.

Table IV-9.—Factor weights by local water users and salinity interests¹

Factor	Water users	Salinity interests
<i>Winter Water.</i> Priorities for developing winter service systems.	25 - Local water users anticipate improvement in their winter water systems.	20 - Salinity interests will not be impacted by the modifications proposed for the winter water systems.
<i>Salt Load.</i> Project area salt load contribution to Colorado River system.	40 - Local participants understand the objective of the study and have a keen interest in its success.	65 - This factor is the primary objective among salinity interests.
<i>Project Cost.</i> Cost of alternatives.	10 - Considerable cost sharing is available, which lessens the local burden of the cost obligation.	13 - Salinity interests include custodians of Federal funds required to repay these costs.
<i>Wetland Acres.</i> Acres converted from wetland to cropland.	20 - Albeit the irrigators view this action to be beneficial to them, the number of acres involved is not substantial.	1 - Salinity interests are concerned about losing wetlands; but the number of acres is nominal.
<i>Construction Employment/Income.</i> Construction employment and income.	5 - The beneficial effects of increased revenues and jobs are recognized by local residents.	1 - Salinity interests are concerned about the impacts of the project on the local economy; however, many do not reside in the immediate area and do not view this factor as highly significant.

¹ Derived by Reclamation's MATS computer program, which showed that the RP plan is viewed as the most acceptable plan based on the social concerns associated with the factors cited. Factor values were standardized and placed on a scale of 1 to 10. The *project cost* factor is negative while all other factors are positive.

The RP plan scored 84 on the water users' preference and 85 on the salinity interests' preference. The NED plan was the second most preferred, with scores of 69 and 73 for the water users and salinity interests. The future-without-plan came in last, with scores of 10 and 13 on the preference scales.

Plan Selection Summary

Based on the preceding analyses and summarized in table IV-11, the RP plan has been selected as the preferred plan. This plan is a combination of Reclamation's off-farm measures (NED and RP plans are the same for off-farm

Table IV-10.—Factor and plan performance
concerned publics

	Water users			Salinity interests		
	Impact rank within plan	Weight by users	Rank x weight	Impact rank within plan	Weight by users	Rank x weight
RP plan						
Winter water	1.0	25	25	1.0	20	20.0
Salt load	.9	40	36	.9	65	58.0
Project cost	.4	10	4	.4	13	5.0
Wetland acres	.9	20	18	.9	1	.9
Construction employment/income	.2	5	1	.2	1	.2
Total score			84			85.0
NED plan						
Winter water	1.0	25	25	1.0	20	20.0
Salt load	.7	40	28	.7	65	46.0
Project cost	.5	10	5	.5	13	7.0
Wetland acres	.5	20	10	.5	1	.5
Construction employment/income	.2	5	1	.2	1	.2
Total score			69			73.0

Table IV-10.—Factor and plan performance
concerned publics (continued)

	Water users			Salinity interests		
	Impact rank within plan	Weight by users	Rank x weight	Impact rank within plan	Weight by users	Rank x weight
No action plan						
Winter water	0	25	0	0	20	0
Salt load	0	40	0	0	65	0
Project cost	1	10	10	1	13	13
Wetland acres	0	20	0	0	1	0
Construction employment/income	0	5	0	0	1	0
Total score			10			13

features) and USDA's sprinkler irrigation systems treatment on 26,000 acres, surface improvements on 10,050 acres, and management practices. The RP plan (preferred plan) meets the four tests of viability (completeness, effectiveness, efficiency, and acceptability), and provides greater salt load reduction than the NED plan.

Table IV-11.—Summary comparison of viable plans and the no action alternative

	Present level condition	No action condition	RP plan	NED plan
Salinity control				
Project area salt contribution (tons)	263,500	244,000	82,960	96,410
Salt removed annually (tons)	0	9,500	161,000	147,600
Onfarm improvements				
Gravity sprinkler (acres)	1,140	1,140	16,350	16,350
Pressure sprinkler (acres)	200	200	9,650	9,650
Onfarm surface improvements (acres)	0	0	10,050	0
Total irrigated land (acres)	48,910	45,280	45,280	45,280
Off-farm improvements				
Canal and laterals eliminated (miles)	0	0	156	156
Off-farm delivery placed in pipe (miles)	0	0	97	97
PRWID culinary connections (each)	0	0	50	50
NEWUA culinary connections (each)	0	0	163	163
Stock ponds lined (each)	0	0	83	83
Cottonwood Creek M&I pipeline (miles)	0	0	11	11
Impacts				
Wetlands/riparian—project area total (acres)	27,990	27,490	21,900	22,308
Mitigation off-farm (acres)	0	0	330	330
Areas converted to upland (acres)	0	500	5,260	4,852
Colorado River depletion (acre-feet)	0	2,000	25,310	22,410

The alternative is complete, as all proposed facilities can be installed to result in the reduction of salt to the Colorado River. The alternative is acceptable to the Salinity Forum, the local farmers impacted, and the State of Utah.

While the additional increment (surface improvement on 10,050 acres) is not as cost effective as the NED component, the plan addresses the identified problem and the objectives of the salinity control program and is more cost effective

than most other units of the Salinity Control Program. It provides the greatest protection to the resource (water quality) by planning for the greatest decrease in total salt contribution to the Colorado River System.

FINANCIAL AND ECONOMIC ANALYSIS

Cost Effectiveness

Cost effectiveness, the primary criterion for development and selection of salinity control projects, is defined as the cost to the Federal Government required to achieve a 1-ton reduction per year in salt loading from the project area. The annual salinity costs include the annual value of the capital investment amortized over the 50-year life of the unit at an interest rate of 8-7/8 percent, in addition to the annual OM&R costs.

Since present plans indicate that Reclamation's components of the RP plan must be implemented in conjunction with the USDA RP plan, the combined costs and tons of salt removed are used in computing the cost effectiveness of each subunit. The RP plan would reduce salinity by 161,000 tons per year at an annual cost of \$6,305,139, as shown in table IV-12. The overall cost effectiveness of this plan is \$39 per ton. By itself, the cost effectiveness of the winter water replacement increment is \$15 per ton and would control 32,880 tons of salt annually.

Since salinity control is the primary purpose of the Unit, the salinity reduction plans were formulated to maximize salinity control based on cost effectiveness, overall effectiveness (as measured in tons per year), and with consideration of environmental and social impacts. A summary of estimated construction costs follows table IV-13.

Irrigation Improvement Facilities

Reclamation developed construction costs for off-farm irrigation laterals. These costs are estimated to total \$30,183,300, based on 1989 prices. These funds would provide off-farm delivery systems capable of sprinkler irrigating 7,600 acres in the Carbon subunit; 4,760 acres in the Cottonwood subunit; 5,050 acres in the Ferron subunit; 4,815 acres in the Huntington-Cleveland subunit; 400 acres in the Moore subunit; and 3,215 acres in the Price-Wellington subunit.

The SCS developed the costs for the onfarm sprinkler systems to work in conjunction with Reclamation's off-farm delivery system on the above acreages. Cost-per-acre values are for gravity sprinkler improvements (\$588 per acre) and for pump sprinkler improvements (\$533 per acre).

Table IV-12.—Cost effectiveness of combined salinity reduction
RP plan

	Reclamation off-farm irrigation improvements	SCS onfarm irrigation improvements	SCS onfarm & Reclamation off-farm (total 1 & 2)	Winter water only	Summary
Capital costs summary ¹					
Onfarm					\$42,348,570
Off-farm					\$30,183,300
Winter water					\$5,179,000
Total					\$77,710,870
Capital costs ¹					
Onfarm		\$42,348,570	\$42,348,570		\$42,348,570
Landowner (-)		9,825,810	9,825,810		9,825,810
Onfarm (subtotal)		\$32,522,760	\$32,522,960		\$32,522,760
Off-farm	\$30,183,300		\$30,183,300	\$5,179,000	\$35,362,300
Interest during construction (off-farm) ²	\$1,779,000		\$1,779,000	\$368,000	\$2,147,000
Capital investment (Fed.)	\$31,962,300	\$32,522,760	\$64,485,060	\$5,547,000	\$70,032,060
Annual investment ³	\$2,877,590	\$2,928,089	\$5,805,679	\$499,460	6,305,139
Total annual cost	\$2,877,590	\$2,928,089	\$5,805,679	\$499,460	\$6,305,139
Tons of salt removed			128,160	32,880	*161,040
Cost per ton			\$45	\$15	\$39

¹ Preauthorization and archeological excluded.² Interest during construction (IDC) was determined for the off-farm reclamation portion. There is no IDC associated with onfarm costs funded by SCS.³ Does not include annual OM&R since these costs are not Federal costs.

* Rounded to 161,000 in text.

Table IV-13.—Domestic service and lined stockwater ponds
capital cost per each connection or pond

	Each connection PRWID	Each connection NEWUA	Each stockwater pond
Connection fee	\$550	\$1,250	
Water meter	\$260	\$260	
3/4" polyvinylchloride (PVC) pipe	\$506	\$506	
Automatic livestock waterer	\$484	\$484	\$484
Excavation			\$6,320
Earth cover			\$535
20-Mil PVC liner			\$1,846
Fence			\$2,100
Gate			\$100
2' PVC pipe			\$1,250
Inlet screen			\$25
Subtotal	\$1,800	\$2,500	\$12,660
Unlisted (10 percent)	\$180	\$250	\$1,270
Subtotal	\$1,980	\$2,750	\$13,930
Contingencies (20 percent)	\$396	\$550	\$2,790
Field cost	\$2,380	\$3,300	\$16,720
Engineering and overhead (33 percent)	\$785	\$1,089	\$5,520

Costs summary by evaluation unit

Construction costs (1989 prices in dollars)¹

Off-farm pipeline systems	\$8,212,400
Carbon system	5,405,800
Huntington-Cleveland system	5,600,000
Cottonwood system	6,745,300
Ferron system	3,542,400
Price-Wellington system	677,400
Moore system	
Onfarm irrigation system (70-percent Federal cost share)	\$10,502,110
Carbon system	10,672,280
Huntington-Cleveland system	7,434,440
Cottonwood system	7,291,050
Ferron system	4,885,360
Price-Wellington system	1,563,330
Moore system	
Culinary system—capital cost	\$197,000
PRWID	846,000
NEWUA	
Stockwater ponds	\$1,915,000
Cottonwood Creek pipeline	2,221,000
Total	\$77,710,870

¹ Does not include planning costs.

In addition, the RP plan includes onfarm surface treatment of 2,100 acres in the Carbon subunit; 1,670 acres in the Cottonwood subunit; 1,500 acres in the Ferron subunit; 3,300 acres in the Huntington-Cleveland subunit; 400 acres in the Moore subunit; and 1,080 acres in the Price-Wellington subunit. The SCS estimated the cost to treat the area with surface improvements to be about \$1,400 per acre.

Winter Water Improvements

The total cost for winter livestock water improvements is \$5,179,000. Capital costs for each domestic water service are summarized in table IV-13. To add 50 connections to the PRWID system and 163 connections to the NEWUA system would cost \$158,000 and \$715,000, respectively, for a total capital cost of \$873,000.

The estimate assumes that any other improvements to the system would be the responsibility of the domestic water supplier and that those improvements, if required, could be paid for with proceeds from the connection fees.

No major improvements are expected to be required on the Price River and Miller Creek systems, but about 1.5 miles of 3-inch-diameter pipe might be required on the North Emery system to provide looping and increase pressure in the Twin Peaks area. To line 83 ponds in the project area would cost \$1,915,000. The cost for the Cottonwood Creek M&I Line includes 10.6 miles of pipeline and was estimated including the costs of stream crossings, highway crossings, valving and mobilization. The total cost of this system is \$2,221,000.

The \$81,800 reduction in O&M for off-farm irrigation improvements is measured from the estimate of the preproject "thorough and timely" O&M. This decrease is partially offset by the \$32,200 increase in O&M of the winter water increment. However, because the farmer is not expected to reimburse the Federal Government for the theoretical net decrease in off-farm O&M, the effective change in O&M for these calculations is zero.

For an annual cost of \$499,400, the salinity reduction from the winter water component is 32,880 tons annually. Total annual direct downstream benefits would be \$1,687,730 from this increment.

Salinity Cost Sharing and Repayment

For the USDA salinity program, the Salinity Control Act (Public Law 93-320 as amended by Public Law 98-569) states in part that the Federal cost-share level is to be limited to a maximum of 70 percent, a minimum of 30 percent would be paid by landowners unless the Secretary of Agriculture determines that such a requirement would result in a failure to start needed onfarm measures. By general consensus among SCS personnel, local irrigation company officials,

county commissioners, and the SCD, it is anticipated that a 70-percent Federal and 30-percent local cost-share rate is needed to accelerate the installation to a level allowing full implementation in a reasonable period of time. This ratio was determined by taking into account net onfarm benefits, capital expenditures required, and downstream salinity benefits versus onfarm benefits. Project implementation cost share applies to the onfarm distribution systems, the off-farm systems essential to provide operating pressure for onfarm systems, and wildlife habitat replacement or enhancement.

Low interest loan money is available to landowners through FmHA and the Utah State Agriculture Resource Development Loan Program (ARDL).

The total cost for onfarm irrigation improvements—including technical assistance, project administration, and wildlife habitat replacement—would be \$42,348,570 with the USDA funding \$32,522,760, the farmers paying \$9,825,810, and an undetermined entity arranging for the payment to the Service of \$224,600 for depletion of flow to the Colorado River System.

Improved management practices would be required as a condition for cost-share assistance for other practices where such management practices are necessary to achieve project objectives. The combination of more efficient management and improved systems would increase crop yields and net returns.

For Reclamation projects, the Salinity Control Act requires that 30 percent of the costs of construction, operation, and maintenance of newly authorized units⁹ (including measures to replace wildlife values foregone) would be reimbursed from the basin fund as follows:

The Upper Colorado River Basin Fund's portion of construction and replacement would be repaid with interest within 50 years or less, if the life of the facilities is shorter than 50 years.

The Lower Colorado River Basin Development Fund's portion of construction and replacement would be repaid either without interest during the year costs are incurred, or, if the fund is unable to repay during the year the costs are incurred, with interest as soon as monies are available.

Table IV-14 displays reimbursable and nonreimbursable amounts for the RP plan computed in accordance with provisions of Public Law 93-320 (the Salinity Control Act) as amended by Public Law 98-569. The Salinity Control Act specifies that 30 percent of the project costs will be reimbursable by the Upper and Lower Colorado River Basin Development Funds. Reimbursable costs are divided 15 percent to the Upper Basin and 85 percent to the Lower Basin.

⁹ The Price-San Rafael Rivers Unit is a newly authorized unit.

Table IV-14.—Reimbursable and nonreimbursable amounts for salt reduction components
(1989 dollar value)

	Reclamation off-farm irrigation improvement plan	Reclamation winter water plan	Combined winter water and irrigation improvement plans	USDA onfarm irrigation improvement
Construction cost	\$30,183,300	\$5,179,000	\$35,362,300	\$42,348,570
IDC ¹	<u>1,628,000</u>	<u>337,000</u>	<u>1,965,000</u>	
Total investment	\$31,811,300	\$5,516,000	\$37,327,300	\$42,348,570
Annual construction cost	\$ ¹ 2,637,730	\$ ¹ 457,390	\$ ¹ 3,095,120	² 2,609,050
Annual interest during construction	134,992	27,944	162,936	
Annual OMR&E (local costs)	0	0	0	869,040
Education				35,000
Other implementation costs				<u>1,168,690</u>
Total average annual costs	\$ 2,637,730	\$ 457,390	\$ 3,095,120	\$ 4,681,780
Reimbursable from the Upper and Lower Basin funds ³	791,319	137,267	928,536	
Upper Colorado River Basin funds (15 percent of reimbursable amount) ⁴	118,698	20,583	139,280	
Lower Colorado River Basin funds (85 percent of reimbursable amount) ⁴	672,621	116,634	789,256	
Total annual nonreimbursable costs	\$ 1,846,411	\$ 320,173	\$ 2,166,584	\$ 1,753,670

¹ Fiscal year 1990 repayment rate for the Colorado River Basin Salinity Control Act is 8-1/8-percent interest; 50-year repayment period. IDC would be compounded over the first 3 years; benefits would begin to accrue in the last half of year 3. Thereafter, simple interest would accrue to the average expenditure (one-half of the total annual expenditure), during each construction year, with project benefits accruing at the end of each year. For the off-farm irrigation improvement plan, simple interest would accrue during years 4 through 11. Year 11 is the last year of the construction schedule. For the winter plan, simple interest would accrue during year 4, which is the last year of the construction schedule. If the Lower Colorado River Basin Fund could not repay in the year costs were incurred, compound interest would apply on segments after the third year.

² The interest rate used on the USDA onfarm annual construction cost was 8-7/8 percent.

³ Public Law 98-569, the Colorado River Basin Salinity Control Amendment, October 1984, provides that 30 percent of the costs of newly authorized projects would be reimbursed from the basin funds as follows:

The Upper Colorado River Basin Fund's portion of construction and replacement would be repaid with interest within 50 years or less if the life of the facilities is shorter than 50 years. The Lower Colorado River Basin Development Fund's portion of construction and replacement would be repaid either without interest during the year the costs are incurred, or, if the fund is unable to repay during the year the costs are incurred, with interest as soon as monies are available. Operation and maintenance repayment from the Upper Colorado River Basin Fund and the Lower Colorado River Basin Development Fund would be repaid the year next succeeding the fiscal year in which costs are incurred.

⁴ Colorado River Basin Salinity Control Act, Public Law 93-320, June 1974.

Amounts are based on fiscal year 1990 repayment rate for the Colorado River Basin Salinity Control Act of 8-1/8-percent interest and a 50-year repayment period.

For the winter water plan, the annual amount to be reimbursed by the Upper Colorado River Basin Funds would be \$20,583. Annual reimbursement from the Lower Colorado River Basin Funds would be \$113,639, including interest.

Implementation Considerations/Uncertainties

Schedule

The complete project is expected to take 10 to 15 years to implement, including 1 year of preconstruction work by Reclamation following construction authorization by Congress for the off-farm facilities and 4 years of SCS technical assistance after all facilities are installed. Onfarm planning would begin as soon as the plan was approved; however, onfarm construction may be dependent on off-farm facilities. Actual construction of both onfarm and off-farm facilities would begin during the third year after congressional authorization for construction.

The process by which specific laterals would be identified for implementation is the formal commitment of farmers on a given piped lateral to participate. A significant participation rate for each lateral would be required before Reclamation and SCS initiate the design of piped lateral facilities.

The SCS would assist program participants with the development of individual or group salinity control plans. Advanced planning activities for off-farm facilities would begin as soon as construction funds were authorized by Congress.

Irrigation evaluations would be done as part of the normal planning process on all SCP's involving irrigated lands. The evaluations would identify the potential change in irrigation efficiency and amount of deep percolation as a result of installing the proposed practices. The SCS' Farm Irrigation Rating Index (FIRI) or similar procedure would be used to make these evaluations.

Wildlife habitat evaluations would be done as part of the normal planning process on all SCP's. Baseline conditions would be determined during the resource inventory phase of the planning. As alternatives were developed, the potential changes in habitat values would be determined and explained to the decisionmaker. In addition, as part of the planning process, economic effects would be evaluated on all SCP's.

Conditions Precedent to Construction

Before construction began on sprinkler irrigation laterals, each farmer's water rights would be reviewed to ensure that he had a water supply adequate to justify the Federal expenditure. Before construction could begin on the overall Unit, contracts would be required between the United States and the affected canal companies in the Unit area. One contract would specify the method and actual cost of the piped laterals and stock pond replacement. A second contract would require that the affected canal companies assume all obligations relating to the continued O&M of the laterals and stock ponds, and would also identify the amount and disposition of any saving in O&M costs from off-farm facilities. A third contract with the cities of Orangeville and Castle Dale for the O&M of the Cottonwood pipeline would be executed. All contracts would require that the facilities and the winter water program be operated in such a manner that the planned salinity reduction would be achieved. A contract between the United States and UDWR or another non-Federal management agency would also be necessary to ensure administration and maintenance of the wildlife area and related features prior to any land acquisition.

Uncertainties

A considerable amount of water within the project area has been sold or contracted to UP&L for powerplant cooling. In normal and wet years, UP&L has leased a part of this water back to farmers for irrigation, but in dry years, this water would not be available to irrigators. For both the no action condition and the with-project condition, it has been assumed that no UP&L-owned water would be available for irrigation use. Lands currently being irrigated with leased back UP&L water were not considered in the RP plan for treatment.

Preliminary discussions have been held with domestic water suppliers regarding the possibility of providing domestic water for winter livestock use at a subsidized rate. Based on these discussions, it appears that such a measure would be possible to implement; however, specific details as to how to provide the subsidy, system capabilities, and potential problems have not been closely examined. Furthermore, specific problems that might be involved in negotiating agreements with the domestic suppliers have not been identified.

Geology and Construction Materials

A brief geologic surface reconnaissance was conducted along short sections of the class A canals and laterals in order to identify general geologic conditions and to formulate design and construction recommendations which could affect the overall design, cost estimate, and construction of the Unit. No subsurface exploration or laboratory testing was performed as part of the reconnaissance.

There are numerous aggregate borrow sources throughout the area. These are located in colluvium, alluvium, and glacial outwash deposits. Approximately 2,000 cubic yards of borrowed river washed gravels owned by Reclamation are available at Swazey Diversion Dam on Cottonwood Creek. Reclamation also owns one borrow pit north of Castle Dale and one near Huntington North Reservoir.

Rights-of-Way and Relocation Requirements

The United States would obtain easements or rights-of-way for the construction and future O&M of the preferred plan. It is assumed that the piped lateral systems and the lining of stock ponds would, in general, fall within the operating boundaries of the present system, hence minimizing the need for rights-of-way.

Additional land necessary for the development of the plan would include acreage for a field station, borrow areas, and wildlife mitigation, or approximately 385 acres. Specific lands for these needs have not been identified. Because of the vast amount of federally owned land in the project area, it is expected that some of the required land would fall under the jurisdiction of the Bureau of Land Management (BLM). Required rights-of-way over those lands would be obtained from BLM, although general administration of the lands would remain with that agency. The remaining land would be acquired by conventional acquisition methods.

Construction of piped laterals and stock ponds may require the reconstruction of county road bridges and crossings, farm road crossings, irrigation crossings, and irrigation turnouts. Fence crossings and gates along the canals and stock ponds would be provided where they occur on present alignments.

Monitoring and Evaluation

The general purposes for monitoring and evaluation (M&E) activities are to: collect salinity control data; evaluate the effect of salinity reduction practices on salt load; and verify project effectiveness, costs, economic benefits, and impacts on wetland/wildlife habitats.

The SCS would monitor the salinity project throughout the installation period and for 2 years after all practices are installed. The M&E plan for the Unit would be developed by SCS in consultation with other agencies prior to the development of individual onfarm salinity control contracts. The M&E plan would contain specific parameters of data collection, evaluations, and reports that will be completed containing information on hydrosalinity, wetland/wildlife habitat, and economics.

General criteria that would be considered in the development of the M&E plan are contained in the SCS "Framework Plan for Monitoring and Evaluating the Colorado River Salinity Control Program," Attachment X. All M&E activities would be carried out in accordance with Utah water rights and water laws.

Changes in salt loading would be estimated by evaluating inflow and outflow measurements from selected fields, along with meteorological and soil moisture data. In addition, the U.S. Geological Survey and Utah Department of Environmental Quality gauging and water sampling station data would be evaluated. These data would be analyzed to evaluate the cumulative effects of the irrigation system improvements and irrigation management being applied.

The wetland/wildlife components of the M&E plan would include tracking wetland types and amounts, field collection of habitat variables and analysis using Habitat Evaluation Procedures (HEP), establishment of selected off-farm vegetative transects, and verification of a sample of individual salinity control plan information. Number and frequency of samples would be determined in the M&E plan. The vegetative monitoring would include the establishment of 18 tracts for obtaining true color aerial photography. The initial photography would be obtained in 1992, with updated photography on a 3- to 5-year cycle for the duration of the M&E activity.

Wildlife habitat values would be monitored using the Service's HEP. HEP would be used to determine habitat values through calculation of a Habitat Suitability Index (HSI) for selected species.¹⁰ The wildlife species for which habitat would be evaluated would be selected in consultation with the Service, EPA, and Reclamation. An appropriate species model would be used for each wetland type.

Selected SCP's would be monitored on a 3-year cycle and the net change in habitat quantity and quality evaluated. Vegetative transects or other acceptable methods would be established and monitored to record vegetation changes where major impacts on habitat are expected. The wildlife habitat evaluations from the individual SCP's would be analyzed to determine the accumulated changes in the amounts of various types of upland and wetland habitats.

Economic impacts from the individual SCP's would be analyzed, and aggregate project-wide projections would be prepared. These analyses would include estimates of investment in treatment, production costs, and production outputs.

SCS would be responsible for preparing an annual report summarizing the preceding year's onfarm accomplishments in areas of salinity control and conservation treatment installed. Information would be included from various

¹⁰ The HSI is a numerical representation of the habitat variables, and future change in this index (+ to -) would indicate changes in habitat quality.

local, State, and Federal agencies, including data on costs of installing treatments, landowner's economics, treatment effects, impacts on wetland and terrestrial wildlife habitat by acre impacted and habitat type, and the progress of voluntary wetland/wildlife habitat value replacement.

In addition, the report would address what practices are needed to mitigate losses of wildlife habitat values. Recommendations would be given that suggest how previously applied wildlife practices could be modified and improved to further enhance their benefits to wildlife. This information would be used by the SCS staff to direct their efforts in accomplishing the goal of obtaining salt load reduction as well as voluntary replacement of all incidental fish and wildlife values foregone due to implementation of the project.

Project Administration

The United States would execute contracts with affected canal companies in the Unit area for the administration of the project facilities. These canal companies would continue to operate and maintain their own distribution facilities, including the piped lateral systems and lined stock ponds and the new stock ponds. The companies would continue to contract with the water users for the sale of water and for operational arrangements affecting each water user.

UDWR has requested the responsibility of administering the wildlife habitat mitigation area established by Reclamation, and the Service concurs with its request.

The LSCC composed of Federal, State, and local officials, would recommend priorities for assistance and would coordinate efforts toward implementation. Landowner applications would be rated according to the following criteria: wildlife habitat practices (either replacement or enhancement), cost per ton of salt removed, change in irrigation efficiencies, acres of irrigated land treated, and prior planning.

Priorities for project implementation would be given to requests with the highest cumulative rating from all criteria evaluated. The initial grouping of farms on a given lateral was created for hydraulic design purposes and is not fixed. The project would be flexible, to allow for realignment of boundaries and conveyance systems, where appropriate.

The purpose of this rating system is to encourage the greatest accomplishment of the CRSC program with the least detrimental effect to wildlife. Therefore, the LSCC would have the responsibility to adjust the criteria to assure adequate wildlife habitat value replacement.

Utah State University Extension Service working in conjunction with the LSCC would provide information and education to the public regarding the project.

This service would include workshops, seminars, printed publications, video publications, demonstration plots, or other educational material concerning the salinity program.

Other Arrangements

The program would continue to be a joint effort by USDA and Reclamation to ensure that the onfarm and off-farm portions were constructed in conjunction with each other. The program would be administered in Carbon and Emery Counties by USDA and Reclamation in coordination with SCD, ASCS County Committees, and the LSCC in the installation period.

Before cost sharing was approved for an individual landowner, an SCP would be written by the landowner with SCS assistance. The SCP would specify irrigation components, wildlife habitat components to be installed, and implementation of needed management practices. The SCP would be the basis of a contract between the ASCS and the individual landowner covering the cost sharing during the installation period as well as O&M for the life of the cost-shared practices (usually 25 years).

SCS would monitor progress of the SCP for 2 years beyond the time that all practices were installed. Monitoring would be documented with an annual status review that would cover installation of the system as well as proper irrigation management. At the end of this period, SCS would certify completion of the SCP.

ASCS would be responsible for monitoring the proper use of cost-shared practices for the remainder of the expected life of the practice. ASCS would check a minimum of 10 percent of the contracts each year, and would also check any contract which had been brought to their attention through a complaint. If a landowner was found to be violating the contract, the contract could be terminated. If the contract was terminated, the landowner would repay all or part of cost-shared monies received.

Chapter V
**AFFECTED ENVIRONMENT AND
ENVIRONMENTAL CONSEQUENCES**

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INTRODUCTION

This chapter presents a description of relevant features of the existing environment and an analysis of environmental impacts under the Resource Protection (RP), the National Economic Development plan (NED), and the no action alternative—the future without the project. The RP plan is the preferred plan. Tables V-1 and V-2 cite compliance actions and resource effects of the project.

The primary effect of implementing the preferred plan would be its contribution to the maintenance of acceptable salinity concentrations in the Colorado River downstream. Other effects would include the removal of saline seep water from the Price and San Rafael Rivers and a loss of wetland and other wildlife habitat, which would be replaced by the project under the off-farm component and voluntarily replaced under onfarm measures. Under the no action alternative as described by both agencies, no significant change is anticipated in salinity.

Because the Bureau of Reclamation (Reclamation) and the United States Department of Agriculture (USDA) operate under different mitigation/replacement policies, impacts and mitigation measures addressing each alternative are discussed from each agency's perspective under off-farm measures (Reclamation), and onfarm measures (USDA). Moreover, because landowners participation would be voluntary and therefore difficult to quantify, a worst-case impacts scenario has been assumed.

RATIONALE

The focus in this chapter is on environmental issues determined to be significant in terms of context and/or intensity (intensity refers to the severity of an impact and includes both beneficial and adverse consequences that may result from proposed actions). This project has been analyzed in terms of the project context/location—specifically Carbon and Emery Counties—and the region—the Price and San Rafael River basins of the Green River drainage of the Colorado River Basin Salinity Control Project.

Significance is also based on the scoping process, consultation and coordination with others, and compliance with various laws and regulations (tables V-1, V-2). Meetings were held throughout the planning process to identify issues and alternatives. Based on this process, the following resources have been

Table V-1.--Effects of the preferred plan on resources of principal national recognition, Price-San Rafael River basins, Utah

Type of resources	Principal sources of national recognition	Measurement of effects (USDA)	Measurement of effects (Reclamation)
Air quality	Clean Air Act, as amended (42 U.S.C. 1857h-7, et seq.)	No adverse effect	Improvement: reducing ditch bank burning
Areas of particular concern within the coastal zone	Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451, et seq.)	Not applicable	Not applicable
Threatened and endangered species	Endangered Species Act of 1973, as amended (16 U.S.C. 1531, et seq.)	Depletion charge for decreased streamflow will be paid before implementation	Compliance
Fish and wildlife habitat	Colorado River Basin Salinity Control Act, Public Law 93-320	Converted habitat will be replaced on a voluntary basis	Adverse effect will be fully mitigated
Flood plains	Executive Order 11988, Floodplain Management	No adverse action	No adverse action
Cultural resources	National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.)	Unknown	Unknown
Prime and unique farmland	Council on Environmental Quality memorandum of August 1, 1980; Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	No adverse effect	No adverse action
Water quality	Clean Water Act of 1977 (33 U.S.C. 1251, et seq.)	Reduced amount of deep percolation to ground water; reduced salt load to Colorado River	Reduced salt load to Colorado River; reduced use of herbicides and fertilizers
Wetlands	Executive Order 11990, Protection of Wetlands; Clean Water Act of 1977 (33 U.S.C. 1251-h, et seq.)	Adverse effect on artificial wetlands; wetlands replaced to maximum practical extent	Adverse effects will be fully mitigated; improved habitat values by prohibiting grazing, mowing, pesticide use
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271, et seq.)	Not present in planning area	Not present in planning area

Table V-2.--Preferred plan - compliance with Water Resource Council - designated environmental statutes Price-San Rafael River basins, Utah

Federal policy	Compliance ¹ (USDA)	Compliance (Reclamation)
Archeological and Historical Preservation Act, 16 U.S.C. 469, et seq.	Full compliance	Full compliance
National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Full compliance	Full compliance
Clean Air Act, as amended, 42 U.S.C. 1857h, et seq.	Full compliance	Full compliance
Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	Full compliance	Full compliance
Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Not applicable	Not applicable
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full compliance	Full compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not applicable	Not applicable
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), et seq.	Not applicable	Not applicable
Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.	Full compliance	Full compliance
Land and Water Conservation Fund Act, 16 U.S.C. 4601 - 4601-11, et seq.	Not applicable	Not applicable
Marine Protection, Research and Sanctuary Act, 33 U.S.C. 1401, et seq.	Full compliance	Full compliance
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Not applicable	Not applicable
Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Full compliance	Full compliance
Watershed Protection and Flood Prevention Act, U.S.C. 1001, et seq.	Not applicable	Not applicable
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Full compliance	Full compliance
Farmland Protection Policy Act, 7 U.S.C. 4201, et seq.	Not applicable	Not applicable

¹ Full compliance - Having met all requirements of the statute for current stage of planning (either pre-authorization or postauthorization).
 Partial compliance - Not having met some of the requirements that normally are met in the current stage of planning. Partial compliance entries should be explained in appropriate places in the report and referenced in the table.
 Noncompliance - Violation of a requirement of the statute. Noncompliance entries should be explained in appropriate places in the report and referenced in the table.
 Not applicable - No requirements for the statute required compliance for the current stage of planning.

identified for detailed analyses: vegetation, wildlife, fisheries, threatened and endangered species, water resources, social and economic conditions, recreation, and cumulative impacts.

Other resources also treated, but in less detail, include those related to climate, topography, scenery, geology, minerals, soil resources, and cultural resources.

The analysis begins with a detailed discussion of vegetation/wetlands resources because all the other biological resources considered are associated either directly or indirectly with vegetation, particularly wetlands. In addition, impacts to vegetation also impact wildlife, fisheries, and threatened and endangered species. In order to reduce redundancy, other biological resources are treated in less detail, with reference made to the discussion of impacts to, and mitigation for, vegetation.

UNAVOIDABLE ADVERSE IMPACTS

Because of increased efficiency, some irrigation-dependent wetlands and the wildlife habitat supplied would be lost under each alternative, including no action. The extent of adverse impacts is detailed under the discussion of each alternative. Reclamation would replace wetlands impacted by off-farm construction, as well as rehabilitation of construction sites. The USDA would encourage voluntary wildlife habitat value replacement on each farm it serves.

Implementation of either the NED or RP alternatives would result in depletions to both the Price and San Rafael Rivers and ultimately the Green and Colorado Rivers, which serve as habitat to endangered native fishes. The United States Fish and Wildlife Service (Service) has provided a draft biological opinion that the proposed project will not jeopardize the continued existence of identified endangered species.

LONG-TERM IMPACTS

Unavoidable adverse impacts are assumed to be long-term impacts and include loss of wetland/wildlife habitat and stream depletions. The NED and RP alternatives would reduce salt loading to the Green-Colorado River Systems.

IRREVERSIBLE AND IRRETRIEVABLE IMPACTS

An irreversible impact is defined as a permanent reduction or loss of a resource. Any landowners that participate in a salinity reduction program would be legally bound for the length of the contract and are responsible for operation, maintenance, and replacement of all salinity reduction practices for the life of the project. Wetland losses and water depletions associated with project

activities are therefore considered permanent. The extent of onfarm wetland losses would depend on the level of voluntary replacement by each landowner participating in the program.

VEGETATION

Description of Existing Conditions

The Price and San Rafael Rivers, with drainage areas of approximately 2,300 and 2,100 square miles, respectively, are located almost entirely within Carbon and Emery Counties in east-central Utah. Both watersheds drain into the Colorado River via the Green River. The Price River flows southeast from headwaters in the Wasatch and Tavaputs Plateaus, and the San Rafael River flows east from headwaters in the Wasatch Plateau. Within the Price and San Rafael basins, altitude-appropriate plant communities are found at elevations ranging from approximately 4,000 to 10,000 feet above mean sea level. There are some 2.8 million acres within the study area with the following ownership.

National forest (Forest Service)	250,000 acres
National resource lands (Bureau of Land Management)	1,700,000 acres
Private lands	585,000 acres
State lands	<u>280,000 acres</u>
Total	2,815,000 acres

Most of the proposed project area occurs between 5500 and 6000 feet in elevation within the salt-desert shrub zone. This zone receives less than 10 inches of annual precipitation and is dominated by native communities of shadscale, Castle Valley clover saltbush, fourwing saltbush, mat saltbush, winterfat, and black greasewood. These plants are associated with soils containing varying amounts of salts.

Wetlands

Several wetland types occur within the study area. Major wetlands include Desert Lake, Olson Slough, and forested/scrub-shrub wetlands along major streams and rivers. There are an estimated 11,000 acres of wetlands within the San Rafael River drainage and 8,000 acres within the Price River drainage. An additional 2,850 acres of wetlands occur along the Price River; 3,400 acres along the San Rafael River; and approximately 2,740 acres along Cottonwood, Ferron, Huntington, and Rock Canyon Creeks in the proposed project area.

Within the immediate proposed project area, under the no action condition, onfarm wetlands would occupy an estimated 15,059 acres.¹

One of the major types of wetlands occurring in the area is the palustrine persistent emergent wetland (Cowardin et al., 1979). Common plants include cattail, wire rush, hardstem bulrush, alkali bulrush, reed canary grass, sedges, saltwort, and other species (Utah Division of Wildlife Resources, 1978). These wetlands are commonly referred to as wet meadows and fresh or saline flats and marshes. Most of these wetlands exist because of current irrigation practices, as shown in figure V-1, or from stock ponds created by constructing low dams across small drainages.

The other major wetlands found within the study area along rivers, streams, and larger canals and drains are known as palustrine, forested, broadleaved deciduous wetlands and the palustrine, scrub-shrub wetlands (Cowardin et al., 1979). These plant communities are commonly referred to as riparian wetlands. Common plants include Fremont cottonwood, narrowleaf cottonwood, willows, Russian olive, tamarisk, and black greasewood. Along canals and laterals, forested/scrub-shrub wetlands predominantly contain cottonwoods growing adjacent to the bank. Cottonwoods, and to a lesser extent Russian olive, tamarisk, and river birch, provide the tree overstory. An understory of shrubby willow, rabbitbrush, or greasewood may also occur depending upon the amount of moisture available, soil type, aspect, and other factors. Ground cover varies among several species of grasses, sedges, and rushes, again varying in species composition and density depending upon moisture conditions.

Comparative Impact Analyses

The alternatives differ somewhat in the types of irrigation management employed and therefore differ in their estimated impacts to native vegetation and their respective reduction in salt loading benefits. Where impacts are essentially the same, the alternatives are discussed jointly.

¹ Soil Conservation Service (SCS) estimates for onfarm wetlands were obtained from two sources: *Water Related Land Uses in the West Colorado Hydrologic Area*, Division of Water Resources, Utah Department of Natural Resources, Staff Report No. 8, January 1972; and *Salinity Investigation of the Price-San Rafael Rivers Unit*, Colorado River Water Quality Improvement Program (preliminary), submitted to the U.S. Bureau of Reclamation, United States Department of the Interior, contract No. 1-07-40-S1637, September 1983. The area used in the inventory is limited to the irrigated area and between the fields and streams. The inventory excluded areas under control of Utah Power and Light Company (UP&L). It was assumed that these areas have reverted to desert/scrub. Some of these areas still are irrigated; however, due to the unpredictability of the future use, it was decided to exclude these areas from inventory.

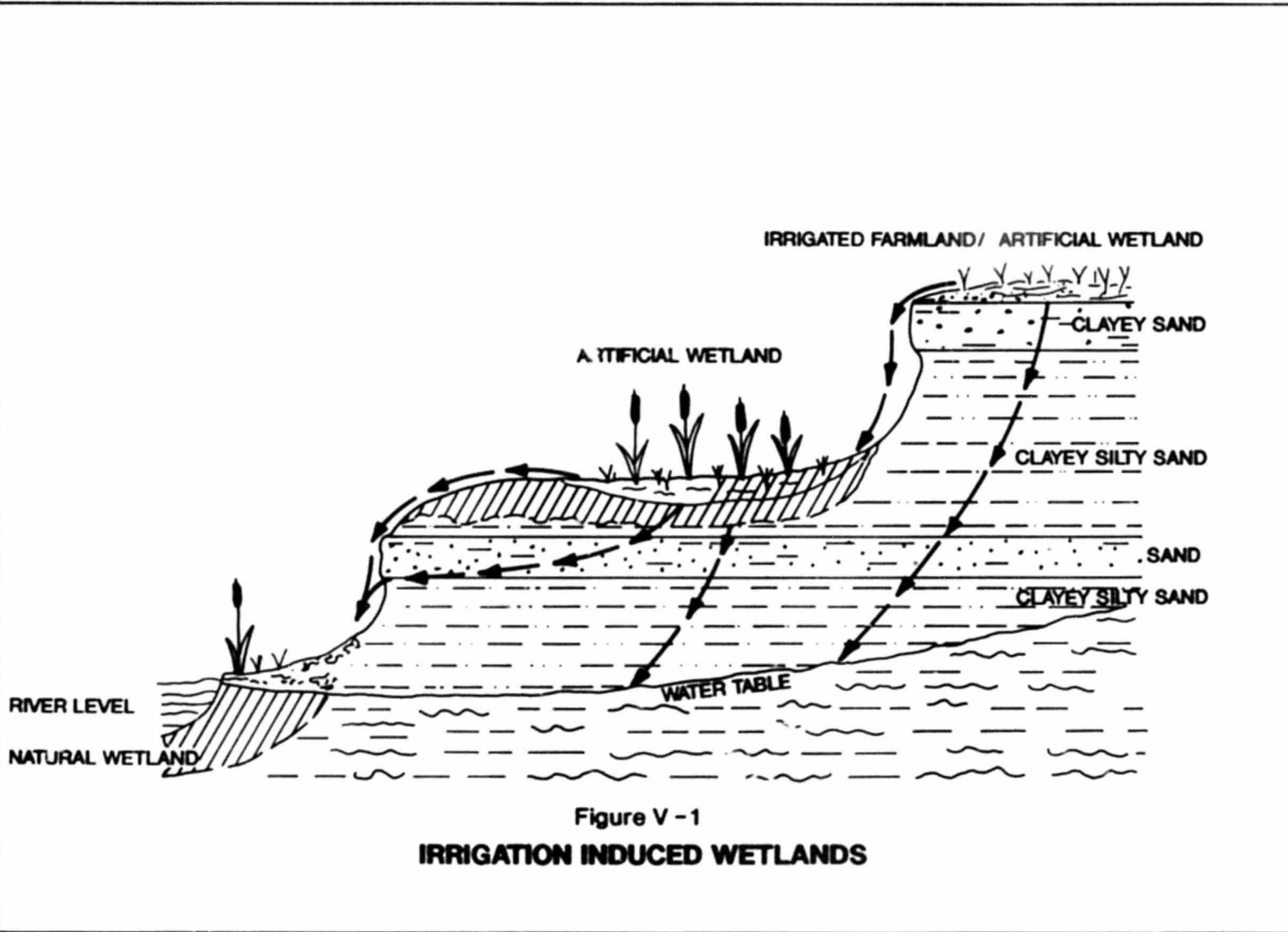


Figure V - 1
IRRIGATION INDUCED WETLANDS

Resource Protection and National Economic Development Plans

These alternatives are a combination of off-farm and onfarm irrigation systems treatment and management practices, as described in earlier sections. The RP plan, the preferred plan, would treat approximately 10,000 more acres than the NED plan. Impacts to vegetation of the two action plans are discussed jointly. The off-farm vegetation impacts of the RP and NED alternatives are the same, and, because of the mitigation component, (described in chapter IV), habitat loss preproject and postproject would essentially be negligible.

Impacts of Off-farm Measures.—The proposed off-farm salinity reduction measures of the RP and NED plans would impact several vegetation types.² Overall, approximately 457 acres of upland salt-desert shrub vegetation would be disturbed, and 130-aggregate acres of palustrine emergent wetlands and 200-aggregate acres of forested and scrub-shrub wetlands would be lost if the off-farm component of either action alternative were fully implemented. Construction activities associated with laying 117 to 97 miles of buried pressurized pipeline would remove an estimated 412 acres of salt-desert vegetation. The new Cottonwood Creek water delivery system would temporarily disturb approximately 45 acres of upland during construction. Following construction, these areas and 412 acres disturbed with construction of the pressurized pipeline would be revegetated. Although no water would be carried by the Mammoth Canal in winter, it would still carry irrigation water during the growing season, and no significant impacts to wetland vegetation are expected.

In the long term, a much larger impact would result from the elimination of 156 miles of laterals within the project area, where wetlands would be affected as soon as water is discontinued. An estimated 62 acres of palustrine emergent wetlands and 200 acres of palustrine forested and scrub-shrub wetlands would lose their primary water supply (table V-3).³ Emergent wetlands characterized by sedge, rush, and cattail communities would be lost rapidly, perhaps within a

² Because landowner participation in the project would be voluntary and therefore difficult to predict, Reclamation has assumed a worst-case, long-term scenario of adverse impacts to vegetation when estimating losses resulting from implementation of the off-farm component of either proposed action alternative. Reclamation believes the impacts cited are maximum estimates since no buried pressurized pipeline would be constructed until USDA contracts are signed with 100 percent of the farms using any particular lateral system.

³ Wetland losses were estimated along 127 miles of laterals using field observations or aerial photography. Approximately 70 percent of all laterals were observed by biologists from the Utah Department of Wildlife Resources, the Service, and Reclamation. An average width of wetland was estimated by observation, multiplied by its length, and the total derived square feet divided by 43,560 to obtain acres. This estimate did not include the area within the lateral or immediately adjacent to the structure that was routinely disturbed during maintenance. Estimated acreage for each lateral was rounded up to the nearest whole acre. Impacts to the remaining 30 percent of the laterals were estimated by Reclamation biologists using low level (660 feet = 1 inch) aerial photography and helicopter ground truthing. Estimates from these sample data were then extrapolated to subsequent estimates of lateral miles abandoned.

year, and if the site were undisturbed, would eventually be replaced by upland vegetation. The forested and scrub-shrub wetlands would begin to lose habitat value, but many woody plants would maintain some growth for years. Without water, however, it is unlikely that cottonwood or willows would successfully regenerate. As dead snags, standing cottonwoods would provide perches for raptors and a suitable substrate for woodpeckers and cavity nesting birds such as the western kingbird, tree swallow, and Northern flicker. Improved efficiency in the delivery of irrigation water and decreased runoff would result in a reduction in annual flows within the Price and San Rafael Rivers of 1,690 and 1,160 acre-feet, respectively. These depletions are not expected to affect wetlands associated with either river system.

Table V-3.—Estimated wetland vegetation losses from canal and lateral abandonment on the Price-San Rafael Rivers Unit

Subunit	Laterals (miles abandoned)	Wetlands lost (acres)	
		Emergent	Wooded
Price River basin			
Price-Wellington	23.6	16.5	9.6
Carbon	36.6	24.8	10.6
Cleveland	8.5	4.0	10.6
San Rafael River basin			
Huntington	21.5	6.7	71.9
Cottonwood Creek	25.8	0.6	44.5
Ferron	34.8	8.6	44.6
Moore	5.1	0.8	8.0
Totals	156.0	62.1	200.8

Impacts of Winter Water Component.—Existing stock ponds are generally shallow and nutrient rich and often support emergent aquatic vegetation within the basin or in adjacent areas that receive pond seepage. These stock ponds provide various habitat requirements for several groups of wildlife including shorebirds and waterfowl. The off-farm component of the RP and NED alternatives would line 83 stock ponds, structurally converting them to deep, steep-sided holding basins devoid of aquatic vegetation. The lined ponds might retain some value as resting places for some waterfowl species but would lose most of the habitat value of palustrine emergent wetlands that many stock ponds now resemble.

Reclamation also proposes to provide domestic water connections to provide winter water for livestock within the Carbon, Cleveland, and Huntington subunits of the proposed project. These connections would eliminate the need for approximately 213 additional stock ponds with accompanying reductions in

salt loading and habitat loss. Definitive data are not available for deriving estimates of the wetland acreage that would be lost from lining and retiring approximately 296 stock ponds within the project area. For the purposes of this report, however, a factor of 0.23 acre per stock pond (CH₂M-Hill 1984), has been used to estimate a stock pond-wetland loss of approximately 68 aggregate acres.

Impacts of Onfarm Measures.—The primary impacts to wetland vegetation resulting from either construction alternative would occur on and directly adjacent to irrigated fields because the majority of onfarm wetlands occur in irrigated pasture or hayfields (agricultural lands with water rights).⁴ These wetlands can be generally classed as emergent, with saturated, temporarily-, or intermittently-flooded water regimes (Cowardin et al., 1979). Dominant vegetation consists of various grasses, forbs, sedges and rushes, depending upon moisture conditions. These areas, commonly called wet meadows, are usually used for livestock grazing or cut for hay—uses which generally reduce an area's value as wildlife habitat. Although waterfowl use in these areas is low, they are used by migrating waterfowl and shore birds. The sites may play a more important role as upland wildlife habitat. Raptors hunt these sites and ring-necked pheasants and other species use them for nesting and winter cover. Forested and scrub-shrub wetlands and upland areas are commonly found on the fringes of irrigated fields or below irrigated fields at sites referred to as waste areas.

The onfarm impacts on vegetation of the RP and NED plans generally differ by only about 8 percent, as shown in table V-4 and often vary only slightly from each other. Because of the voluntary nature of landowner onfarm habitat replacement, as noted, worst-case impacts were displayed. An explanation of calculations of the worst-case impacts is contained in attachment Vii.

The greatest onfarm impact of both action alternatives is the potential loss of emergent wetlands, primarily in fields using improved irrigation management. This worst-case loss estimate is 4,429 acres of emergent wetlands under the RP plan and 4,080 acres under the NED plan. Of the 4,429 acres lost, over 4,000 occur in hayed or grazed fields. The wildlife habitat values of these areas are described on page V-16. Other losses under the action plans would include 832 acres of forested scrub-shrub wetland under the RP plan and 772 acres under the NED plan, primarily in off-field areas that would receive reduced irrigation flows.

⁴ Projects under the Colorado River Basin Salinity Control Program within the USDA are voluntary participation programs. The nature of voluntary programs makes it impossible to identify, during this phase of planning, actual future participants and the degree to which implementation will take place, and also, therefore, site-specific impacts. Because of the uncertainties involved, SCS has adopted a worst-case impact analysis for onfarm action alternatives.

Table V-4.—Projected onfarm vegetation coverage (acres) from no action conditions to full implementation of onfarm measures of the RP and NED plans

Vegetation	In-field estimates			Off-field estimates			River-bottom estimates		
	No action	(RP)	(NED)	No action	(RP)	(NED)	No action	(RP)	(NED)
Emergent wetlands:									
Pasture/hay	9,015	5,617	5,785						
Grass/sedge	930	398	532	1,002	685	701	61	61	61
Rush/cattail	202	86	116	211	144	146	18	18	18
Subtotals:	10,147	6,102	6,433	1,213	829	847	79	79	79
Changes (no action and action plans)		-4,045	-3,714		-384	-366	no change		
Scrub-shrub and forested wetlands:	146	63	84	2,364	1,616	1,654	1,110	1,110	1,110
Changes in wetland		-83	-62		-748	-710	no change		
Totals (changes)		-4,128	-3,776		-1,133	-1,076	no change		
Cropland/hayland (upland):									
Cropland/hayland (upland):	55,357	59,485	59,133						
Changes in cropland/hayland		4,128	3,776						

A more likely estimate of loss is 2,538 acres of emergent wetlands under the RP plan and 2,281 acres under the NED plan. Other losses would include 458 acres of forested scrub/shrub wetlands under the RP plan and 418 acres under the NED plan.

Land use changes of the two action plans are compared with the no action plan in table V-5.

Table V-5.—Projected changes in irrigation coverage (acres) from no action conditions to full implementation of onfarm measures of the RP plan

Land use	No action	RP	NED
Infrequently irrigated	21,170	21,170	21,170
Partially irrigated	12,310	0	1,940
Fully irrigated	32,970	45,280	43,340
Lands with water rights	66,450	66,450	66,450
Total lands treated	0	36,050	26,000

USDA's goal is replacement of all wildlife habitat values since replacement would be a voluntary decision of the landowner. USDA has made a commitment to encourage replacement, as is detailed in the discussion of the preferred plan.

No Action Alternative

The no action alternative seeks to define any developments or events that would probably affect vegetation in the project area without any Federal action.

As noted in the social and economic conditions section of this chapter, no dramatic population changes are predicted for the project area, so it is unlikely that land retirement—and accompanying salinity reduction and major changes—will occur. However, when Utah Power and Light Company (UP&L) uses a remaining 13,400-acre-foot increment to which it has right, the 3,630 acres of land sometimes irrigated by that water would be retired with an accompanying 9,500-ton reduction in salt loading from present conditions and accompanying conversion of 500 acres of wetland to upland.

Phreatophyte communities are expected to remain the same. Conservation and water management practices will remain at about the same level as at present, resulting in slight irrigation efficiency increases.

WILDLIFE

Description of Existing Conditions

Animals characteristic of life zones ranging from high mountain forest to salt-desert shrubland are found in the Price and San Rafael River basins. Approximately 26 species of reptiles, 9 species of amphibians, 270 species of birds, and 90 species of mammals are found in the area (Dalton et al., 1978; UDWR, 1978; Sparks, 1981).

Big Game (Large Mammals)

Principal large mammals found at lower elevations in the study area include mule deer and pronghorn with some mountain lions also present. Mule deer are the most numerous big game animal in the region, but populations have been relatively low in recent years. Although portions of the study area could support more mule deer, productive winter range is the limiting factor for mule deer distribution over most of the region. Pronghorns are established in eastern Carbon and Emery Counties, with the principal herds found in the Price and San Rafael River basins south and east of Price, and south of Green River. The UDWR has established a pronghorn herd, which is part of the Iclander Wash herd, in the Castle Valley area.

Upland Game

Several species of upland game animals are found in the area. Ring-necked pheasant, California quail, and mourning doves represent important game birds associated with agricultural lands at lower elevations. Cottontails are the most important upland game mammals found in several cover types throughout the project area.

Waterfowl

The Desert Lake Waterfowl Management Area south of Price and the wetlands near Huntington are probably the most productive waterfowl habitats in the region. The UDWR operates the Desert Lake Waterfowl Management Area in Emery County. This area has 2,621 total acres with 544 acres of open water, providing habitat for 23 species of waterfowl, numerous shorebirds, raptors, and other wildlife species. Olson Slough, northeast of Desert Lake, provides limited waterfowl use and hunting. Other scattered wetlands and stock ponds throughout the area also provide nesting, brooding, and resting habitat for waterfowl, while agricultural lands are important feeding areas for some species of resident and migrant waterfowl. The white-faced ibis, mentioned in the

Service's *Coordination Act Report* as a species of concern, is a rare summer resident of the San Rafael desert and a rare transient or summer resident in the remainder of southeastern Utah.

Furbearers

The muskrat is semiaquatic inhabits and is commonly found in close association with canal banks, rivers and streams, reservoirs, and stock ponds. The beaver is also occasionally found in these semiaquatic sites. These two species construct their dens in canal and riverbanks, often causing damage to irrigation facilities. Mink and raccoons probably use the region's larger wetlands with permanent water regimes.

Nongame Species

Nongame Birds.—In general, bird species use the forested/scrub-shrub wetlands to a greater degree than other cover types in the project area. Although the woody vegetation of these wetlands provides yearlong habitat for many birds, this cover type becomes especially important during the winter months when farming practices and grazing eliminate protective cover from croplands and snow blankets much of the native desert vegetation. During the summer, alfalfa fields also support a high diversity of avian species (UDWR, 1978). Fields are often found in proximity to tree lines of Russian olive and other species as well as wetlands. It is difficult to evaluate whether it is the alfalfa or the woody vegetation that attracts birds, or whether some combination of diverse cover supports high bird species diversity. Birds commonly observed in and adjacent to tree and shrub cover include the long-eared owl, American robin, black-billed magpie, and starling. Other common bird species include western meadowlark, horned lark (associated with bare ground habitat), vesper sparrow, red-winged blackbird (associated with cattail wetlands), Brewer's blackbird, and brown-headed cowbird (associated with farmland). The loggerhead shrike is mentioned in the Service's *Coordination Act Report* as a species of concern.

Raptors.—One golden eagle nest has been located in the project area in a large cottonwood tree on the bank of a canal within a 1.3-mile section scheduled for lining. This nest has been active for several years and is unique because of the relative rarity of tree-nesting golden eagles in Utah. The majority of eagle nests are located in cliffs outside the immediate project area.

The rough-legged hawk is probably the most commonly observed raptor in the project area during winter months, while the American kestrel is most common in the summer. The northern harrier or marsh hawk is the second most commonly observed raptor and is present in the area year-round (UDWR, 1978).

Small Mammals.—Many of the most common small mammals found in the area exploit the interface between two or more cover types and undoubtedly owe their success to the vegetation mosaic supported by current irrigation practices. Small mammals include the western harvest mouse and deer mouse. These two species are probably the most abundant mammals in most cover types. Several species of voles inhabit wet pastures, forested/scrub-shrub wetlands, and other areas where ground cover is dense.

Other commonly observed mammalian wildlife include the house mouse, long-tailed weasel, white-tailed prairie dog, cottontails, black-tailed and white-tailed jackrabbit, rock squirrel, striped skunk, coyote, and red fox.

Reptiles and Amphibians.—Temperature-adjusting animals such as reptiles and amphibians generally exhibit low population densities throughout the area because of the extreme seasonal temperature fluctuations. Leopard frogs, garter snakes, western boreal toad, and others are found in emergent and forested/scrub-shrub wetlands. Rattlesnakes, gopher snakes, and sagebrush lizards occur in the desert shrub cover type.

Comparative Impact Analyses

Resource Protection and National Economic Development Plans

No recent estimates of population size exists for any species, other than man, within the proposed project area. Estimates of impacts to wildlife are therefore based upon subjective evaluation of anticipated changes in habitat induced by project-associated alterations in vegetation. Such an approach is facilitated by earlier studies in the proposed project area. In 1977, the SCS funded a wildlife inventory conducted by the UDWR. That work attempted to sample sites representative of cover types in the Price-San Rafael River basins and determine relative abundances of species observed (UDWR, 1978).

The most significant wildlife impacts under either of the action alternatives are probably to nongame birds through loss of wetland habitat, as noted in subsequent discussions. The largest affected acreages, however, are already disturbed by farming activities.

The RP and NED alternatives are considered jointly. The two action plans have the same off-farm impacts to wildlife and similar onfarm impacts, since they differ only in the addition of 10,050 acres to receive surface irrigation improvement (RP plan).

Impacts of Off-farm Measures.—About 457 acres of upland wildlife habitat would be temporarily disturbed during and following project construction activities for either of the action alternatives and then reseeded. Because most

of the disturbed upland areas are small and dispersed or linear in configuration, no long-term impacts to wildlife populations or habitat are anticipated for upland areas.

The lining of stock ponds under the RP or NED plans would lower or eliminate their current value as wildlife habitat. Area stock ponds range in size from 0.1 to 30 or more acres and can be classified as palustrine open water or palustrine emergent wetlands, some of which have artificially flooded water regimes (Cowardin et al., 1979). Larger ponds have greater potential for providing habitat for aquatic and semiaquatic species, but even small areas can be important. Species most commonly observed on and near stock ponds include mallards, killdeer, and common snipe. Ponds with shallow areas can support emergent wetland vegetation and provide food and cover for waterfowl, shorebirds, wading birds, small mammals, and amphibians. Submergent or floating plants may also be present, providing additional food sources for waterfowl. Lining would create stock ponds that are deep (greater than 8 feet), steep-sided, and unsuitable for the growth of most rooted aquatic vegetation; therefore, they would provide relatively poor quality wildlife habitat. Lining and elimination are considered complete losses of emergent wetland unless associated with these stock ponds and would be replaced, as previously discussed.

The habitat value of emergent and forested/scrub-shrub wetlands, directly affected by construction and indirectly impacted through elimination of seepage, would represent a permanent loss on project lands if it were not replaced by the project in-kind habitat program. Roughly 130 acres of palustrine persistent emergent wetlands and some 200 acres of forested/scrub-shrub wetland wildlife habitat would be eliminated by the proposed off-farm construction plan. Although upland habitat would be rehabilitated, wildlife dependent on affected wetlands would be lost due to a lack of other unoccupied suitable habitat in close proximity. As wetlands lose their water supply, wetland vegetation would recede and eventually die, changing wildlife habitat associated with these wetlands into upland cover types and in some cases agricultural fields.

Wildlife habitat provided by wetlands is particularly valuable in this high, salt-desert shrub project area because this habitat type is limited in extent. Wetlands provide food, water, cover, nesting, and/or denning areas for many forms of life including small mammals, amphibians, reptiles, waterfowl, shorebirds, raptors, and a variety of small birds.

Impacts of Onfarm Measures.—Impacts to wildlife and their habitat on private lands served by the proposed project are difficult to predict because of the uncertainties associated with voluntary participation in the program. Estimated acres affected are shown in table V-4. Under the RP plan, the 4,429 acres of emergent wetlands and 832 acres of forested/scrub-shrub wetlands projected to be lost with a full "worst-case" implementation represent

a significant number of acres; however, when put in terms of value to several species of wildlife, the acreage may appear to indicate a more significant change than the actual change in habitat values. The change would be less with the NED plan, under which comparable changes would affect 4,080 acres of emergent wetland and 772 acres of scrub-shrub wetland.

It should be noted that the most significant change in wetland/wildlife acres—approximately 4,045 acres—occurs on pasture/hay and grass/sedge fields that are currently irrigated and used for hayland/grazing and planting of introduced species. These areas are continually disturbed, as are the other agricultural lands within the project area. In addition, these areas are not usually associated with open water, and therefore, they function more as upland habitat than as resources for aquatic species. With the program, these irrigated fields would be changed to alfalfa, improved pasture, and/or grain fields. Uinta Basin CRSC Monitoring and Evaluation Annual Reports indicate that the value changes may not be of a magnitude that would be anticipated by the changes in acreage. The reasons for this difference are not completely known, but one possible explanation is that the change in vegetation from over-irrigated (wetlands) pasture/hayland to alfalfa/grain is not a great change for species that use several cover types associated with irrigated agriculture.

Total impacts to all species are impossible to predict because of the multitude of variables that would have to be analyzed. In general, as the value of habitat for some species such as the meadow vole and common snipe is lowered, it increases or remains unchanged for others, including deer mice, chipmunks, ground squirrels, the western meadowlark, vesper sparrow, rattlesnakes, sagebrush lizards, and other reptiles.

The preferred plan would affect the habitat of some nongame birds more than any other group of wildlife in the project area because these species generally obtain all life requisites from single cover types. The loss of wetland habitat would affect red-winged and yellow-headed blackbirds, marsh wren, sora, and many other species. Similarly, such furbearers as the muskrat that are single-cover type users, would be significantly affected as irrigation supported wetlands were lost.⁵

The preferred plan would not affect the northern harrier hawk. Harriers are rodent hunters. Rodents are generally abundant on agricultural land. Harrier hawks prefer marshes at all elevations within the southern area. The harrier nests in a variety of sites, usually near or above water. It nests in tall grass in open fields, in swamps with low shrubs and clearings, sometimes built up over water on a stick foundation, a sedge tussock, or a willow clump, or on a knoll of dry ground.

⁵ It should be noted that during the last 4 years of data collection in the Uinta Basin, the area has undergone a severe drought. In addition, when data collection was initiated in 1984-85, it was the end of an exceptionally wet cycle of years; therefore, short-term results reported in the *Uinta Basin CRSC Monitoring and Evaluation Annual Report* may not be directly applicable to the Price-San Rafael study area.

The small population of mule deer in the proposed project area would be impacted to some extent. However, if the Uinta Basin is used as a model, the extent of the impact does not appear to be significant. The most common complaint by landowners in that area concerns too many deer in the irrigated area, and there is some indication that increased alfalfa production may attract more deer. However, if the local deer population were to decrease slightly, it may be a benefit by reducing depredation.

Project impacts could cause some adjustments to some raptor territories, but overall, the impacts should be minimal to most birds of prey. Waterfowl in the area would be impacted, but the significance of the impact is questionable. The major open water/marsh waterfowl production areas of Desert Lake and Olsen Slough within the project area would not be significantly impacted.

The loggerhead shrike was mentioned as a species of concern in the Coordination Act Report primarily because of concern for the decrease in the prey base. The shrike is a year-long common resident in all of southeastern Utah, inhabiting desert and submontane habitats (UDWR, 1990). The shrike is not listed as using any wetland ecosystem, but agriculture, sagebrush/grass, saltbush/grass, and black brush are critical. Agriculture will continue and other habitats will be unchanged. The primary prey (83 percent) for the shrike in the West is a variety of insects (mostly grasshoppers and crickets), but it also eats small mammals, birds, and reptiles (Forest Service, 1991). The life requisites for this species will not be significantly impacted.

The white-faced ibis will not be impacted. The ibis prefers to feed in freshwater marshes and sloughs while wading in shallow water. It nests in dense beds of bulrush or on land on the ground among low shrubs and mixed forbs. After nesting season, it feeds in large marshes as well as in irrigated fields (Forest Service, 1991). Large marsh areas will not be significantly impacted by the project.

No Action Plan

The no action alternative would perpetuate the existing conditions described earlier. Since the introduction of irrigation into the study area, there has been a gradual loss of crop production to salt buildup in the soil, waterlogging, and a corresponding shifting from fully irrigated land to partially irrigated land. Given the use of present irrigation methods at present levels of efficiency, it is anticipated that this trend would continue without the proposed project. Such trends should favor wildlife species that are able to exploit habitats characterized by a mosaic of small wetlands, uplands, and croplands.

WATER RESOURCES, USE, AND QUALITY

Description of Existing Conditions

Water Resources

Surface.—Numerous creeks and reservoirs supply water to the Price and San Rafael River basins. The hydrology of the upper 155 square miles of the Price River basin is controlled by the 74,000-acre-foot Scofield Reservoir. The average annual inflow to the Price River is estimated at 112,420 acre-feet. Some 93,200 acre-feet are diverted for irrigation. Over 80 percent of the annual flow occurs from April through August. The average annual outflow of the Price River is approximately 74,000 acre-feet at Woodside, Utah.

The San Rafael River is formed by three major tributaries: Huntington, Cottonwood, and Ferron Creeks. The capacity of the eight largest reservoirs on these tributaries ranges from 500 to 62,500 acre-feet (Utah Department of Water Resources, 1976) (table V-6). The average annual inflow is estimated at 199,840 acre-feet; some 84,900 acre-feet are diverted for irrigation.

Table V-6.—Reservoir storage capacity (acre-feet) and construction date within the Price-San Rafael River basins

Source/reservoir	Capacity	Year constructed
Price River		
Scofield Reservoir	74,000	1946
San Rafael River		
Huntington Creek		
Cleveland Reservoir	5,340	1886
Huntington Reservoir	5,616	1888
Rolfson Reservoir	500	1930
Millers Flat Reservoir	5,600	1953
Huntington North Reservoir	4,850	1965
Electric Lake	30,000	1973
Cottonwood Creek		
Joes Valley Reservoir	62,500	1965
Ferron Creek		
Millsite Reservoir	15,000	1965

Approximately 24,600 acre-feet of diverted water is delivered into the Price River basin. Annual outflow of the San Rafael River is estimated at 81,000 acre-feet.

Ground Water.—The absence of wells, the nature of springs in the area, and the low permeability characteristics of siltstone indicate that the Blue Gate member of the Mancos shale formation underlying the study area contains little or no free water. In some oil and gas test holes, water has been reported near the base of the Ferron sandstone member.

Three springs in the irrigated area were reported to have existed prior to irrigation. The seep at the western edge of Cottonwood Creek about one-half mile southeast of Orangeville, Utah, appears to have its source in buried channel fill. The spring east of the highway near the Ferron church appears to drain from gravels capping the bench to the north and west. The spring north of Ferron Creek about 2 miles east of Ferron is probably from a permeable lens in the flood plain deposits. Other seeps and springs have developed at various places in the area, but they are the result of irrigation.

Water Use

The waters of the Price and San Rafael Rivers were used by the area's first settlers to grow crops. Natural flows from Huntington Creek were appropriated in 1876 when small ditches were dug to divert water onto 320 acres of land. In 1878, canals were dug to divert water from Cottonwood Creek. Diversions from Ferron Creek and Muddy Creek began shortly thereafter. By 1900, all dependable flow in the San Rafael River basin had been appropriated (U.S. Bureau of Reclamation).

The Mammoth Reservoir Company was formed in 1896 to begin development of water from the Price River, and by 1911, all dependable flows of the Price River had been appropriated. The first major storage facility in the Price River basin was Scofield Dam and Reservoir, completed in 1926; however, after a partial failure of the dam, the present Scofield Dam was built in 1946. It has a capacity of 74,000 acre-feet, of which 8,000 acre-feet is dead storage.

Water from the Price River has been adjudicated. None of the water from the Carbon, Price-Wellington, or the Cleveland Canal systems is used directly for domestic or industrial purposes. The Carbon Canal Company and the Price-Wellington Canal Company have direct-flow rights in the Price River and storage rights in Scofield Reservoir. Carbon Canal has a winter water right of about 25 cubic feet per second for livestock.

Castle Dale and Orangeville divert directly from the Mammoth Canal, and other towns in the area divert from local creeks or reservoirs. The Huntington-Cleveland Canal diverts about one-half of its total annual diversion into the

Price River basin. The Huntington-Cleveland Canal Company owns primary flow rights in Huntington Creek and has storage rights in four reservoirs on the creek: Millers Flat, Huntington, Cleveland, and Huntington North Reservoirs. The company also owns water storage rights in Joes Valley Reservoir on Cottonwood Creek.

Water Quality

As noted in chapter II, water in the Price and San Rafael Rivers undergoes major deterioration of quality from both geological and human causes as the streams cross the irrigated sectors of the river basins.

During most of the year, the flow in the Price River in the central basin and the San Rafael River at the junction of the three major tributaries deteriorates because it is composed of variable irrigation return flows, waste discharges from municipalities, and natural flow from tributaries that drain salt-bearing shales. This increases the total dissolved solids (TDS) level from about 300 milligrams per liter (mg/L) to about 2,000 mg/L as measured above and below areas of principal use. Although some deterioration in the chemical quality of the Price River probably would occur in the absence of stream regulation and irrigation in the central basin, deterioration is intensified with the presence of both.

Comparative Impact Analyses

RP and NED Plans

Under the proposed action plans, total diversions within the study area would remain at the present 178,100 acre-feet per year. The amount of water delivered to farms annually would increase from an estimated 136,200 acre-feet for the no action plan to 142,130 acre-feet (RP plan) or 140,140 acre-feet (NED plan). Water quality would improve as salt loading diminished from an estimated 244,000 tons per year to 82,960 tons, or a reduction of 161,000 tons annually (RP plan) or to 96,400 tons, a reduction of 147,600 tons annually (NED plan).

Impacts of Off-farm Measures.—Off-farm impacts would be the same under both action plans. As noted, flows in the lower Price River would be expected to decrease by 1,690 acre-feet annually as the result of off-farm measures. This translates into an average flow reduction of about 2 cubic feet per second (ft³/s), or a decrease of 2 percent. Flows in the lower San Rafael River would decrease by 1,160 acre-feet per year, or an average of 1 ft³/s, or 1.7 percent.

Winter flows in both river systems would revert to conditions reminiscent of pre-irrigation winter-flow patterns. Water quality in both river systems would

be improved slightly by eliminating deep percolation-salt laden water from entering the systems. No negative impacts to flow or water quality are anticipated from off-farm measures.

Impacts of Onfarm Measures.—The majority of changes to water quantity, use, and quality anticipated to result from the action plans can be attributed to onfarm activities. Onfarm deep percolation would be reduced from 64,670 acre-feet annually to 36,960 acre-feet (RP plan) or 40,050 acre-feet (NED plan). Depletion to the Colorado River would increase by 22,460 acre-feet (RP plan) or 19,560 acre-feet (NED plan) per year. Excluding reused water from deep percolation waters that have returned to the stream, onfarm consumptive use of water would increase annually from 54,170 to 82,070 acre-feet (RP plan) or 77,810 acre-feet (NED plan). Surface return flows would be reduced annually from 6,460 to 6,270 acre-feet (RP plan) or 5,200 acre-feet (NED plan). Changes in flow patterns and water quality, and their potential impacts to vegetation types, wildlife habitat, fisheries, and threatened and endangered species are discussed elsewhere.

FISHERIES

Description of Existing Conditions

Some 25 to 35 fish species are known to inhabit the Price, San Rafael, and Green Rivers. The headwaters of both the Price and San Rafael Rivers have good quality water and support populations of trout including cutthroat, rainbow, brown, and brook trout.

The Price River system has the most extensive fish habitat in the region. Scofield Reservoir, an impoundment on the Price River at 7770-foot elevation, is one of Utah's few class I fisheries and is managed for rainbow and cutthroat trout. Rainbows are stocked annually, while the cutthroat trout population is maintained by natural reproduction in streams above the reservoir. Streams above the reservoir provide 63 miles of trout habitat populated with native cutthroats and the stocked rainbow. Below Scofield Reservoir, the Price River has a naturally reproducing brown trout population. Beaver Creek and White River, tributaries of the Price River upstream of the irrigation diversion, also support cutthroat trout populations. In the Price River, sport fish are nonexistent below the first diversion at the golf course because of stream alteration and poor water quality caused by industrial development, channelization, and dewatering for irrigation. From Farnham Dam downriver to the Green River, there is a limited channel catfish population. Upper parts of Grassy Trail, Gordon, and Willow Creeks, which flow into the Price River below the diversion, contain gamefish.

Huntington, Cottonwood, and Ferron Creeks converge in the Castle Dale area to form the San Rafael River. The San Rafael apparently has no gamefish, but

all three headwater creeks support trout fisheries. Huntington Creek, the northernmost tributary of the San Rafael River, has a naturally reproducing cutthroat population in its headwaters including Electric Lake. The 22 miles of Huntington Creek below Electric Lake support cutthroat, brown, and rainbow trout. Upper stretches of Cottonwood Creek and Ferron Creek also support trout fisheries, including naturally reproducing cutthroat and brook trout and stocked brown and rainbow trout. Joes Valley Reservoir, a 1,170-acre reservoir on Cottonwood Creek, and three smaller reservoirs in the Ferron Creek headwaters also support trout fisheries.

The upper midsections of both the Price and San Rafael Rivers are usually dewatered during the main irrigation season; downstream, water temperatures and turbidity are relatively high, and flows may fluctuate dramatically. Accordingly, large reaches of the Price and San Rafael Rivers do not support game fish. In areas where water flow is adequate, sediments are the major fisheries problem. Increased sediments reduce light penetration and aquatic productivity, scour algae and benthos from the bottom, smother fish eggs and larvae, and interfere with filter-feeding organisms and the gill efficiency of fish and invertebrates.

The roundtail chub occurs in the Price River below the Carbon-Emery County line, Huntington Creek, Cottonwood Creek, Ferron Creek, the San Rafael River, and Muddy Creek (Larry Dalton, Resource Analyst, UDWR, personal communication). Little more is known about the species as it occurs in the study area. The roundtail chub has been classified by the State of Utah as "sensitive" and placed on the list of "Native Utah Wildlife Species of Special Concern" (UDWR, 1987). A sensitive species is considered to occur in numbers adequate for survival, but populations have been depleted, or the species occurs in limited areas and/or numbers due to restricted or specialized habitat. A management program is needed for sensitive species (UDWR, 1987). At this time, the species is a candidate for the Federal Threatened and Endangered List.

Comparative Impact Analyses

RP and NED Plans

These action alternatives would directly affect both uplands and wetlands within the study area. Because the NED plan would treat 10,050 fewer acres than the RP plan, onfarm related impacts would be slightly reduced. Indirect effects to area fishery resources through depletion of flows from the Price and San Rafael River basins are considered insignificant.

Impacts of Off-farm Measures.—Proposed off-farm construction by Reclamation would result in insignificant decreases in annual flows for both the Price and San Rafael Rivers under either the RP or NED plan, for which

off-farm impacts are the same. Lower Price River flows would be decreased by 1,690 acre-feet annually. This equates to an average flow reduction of about 2 cubic feet per second (ft³/s), or a decrease of about 2 percent. Flows in the lower San Rafael River would be reduced by 1,160 acre-feet annually, or an average of 1 ft³/s, a decrease of about 1.7 percent. Winter flows in both river systems would revert to a pre-irrigation pattern. Water quality in both river systems would be improved slightly by the proposed project by decreasing the return of salt laden water from deep percolation.

No significant adverse impacts to fishery resources of the Price or San Rafael Rivers would result from the Reclamation proposed action. No gamefish live in the lower sections of these river systems. No impact is expected to the roundtail chub from off-farm measures.

Impacts of Onfarm Measures.—Changes in streamflow are not significant; however, models of the riverflow show that reductions which do occur happen principally during periods of high flow, with little or no reduction during periods of low flow in an average water year. Depletion to the Colorado River System would be 22,460 acre-feet as a result of the RP plan and 19,560 acre-feet from the NED plan.

Roundtail Chub.—The UDWR has requested that the SCS prepare an evaluation of changes in streamflows resulting from the proposed alternatives and identify how the estimated change would affect the roundtail chub. The average annual streamflow was evaluated for the no action and RP alternatives using a "worst-case" analysis. Generally, as noted, the greatest change in flows would be during high flow periods with a minor change during low flow periods. All major streams in the area are controlled by upstream dams; in addition, flows through and below the irrigated areas are highly variable (from 0 ft³/s to flows in excess of 100 ft³/s in any given year). As a result, no significant impact from the project to the roundtail chub is anticipated. A detailed analysis of the change in flows and impacts is contained in attachment VIII.

Other Fishery Resources.—No impact is expected to trout populations in various creeks and reservoirs within the proposed project area since most flow alterations should occur downstream from those populations. No fish, other than the roundtail chub, was identified by UDWR as important below the irrigation diversions in the project area.

No Action Plan

Under the no action plan, the 13,400 acre-feet now available from UP&L in an average or above-average water year would no longer be available. Total

diversions within the study area would be 178,100 acre-feet per year. The amount of water delivered to farms would be an estimated 136,200 acre-feet per year and onfarm deep percolation at approximately 64,670 acre-feet annually. Without a project, there would be no additional annual depletion to regional streams and rivers and no additional potential impact to resident fish populations. Onfarm consumptive use of water would total about 54,200 acre-feet annually. Annual surface return flows would equal some 6,500 acre-feet.

THREATENED AND ENDANGERED SPECIES

Description of Existing Conditions

Reclamation has prepared a biological assessment to evaluate project impacts on threatened and endangered species within the project area (attachment III). The assessment results from a Reclamation memorandum (July 13, 1987) to the Service requesting an updated list for Section 7 (Endangered Species Act) compliance purposes. The Service responded with a memorandum (August 25, 1987) requesting a biological assessment on one threatened and six endangered species. On March 22, 1993, the Service sent an updated list of threatened, endangered, and candidate species containing one additional threatened and three additional endangered species. A supplement to the biological assessment was written to cover these species. The supplemental biological assessment and the Service's response are included in attachment III. One additional endangered species—the peregrine falcon—may occasionally frequent the study area. The long-billed curlew, a candidate species, is also found in the area and has been added to the evaluation.

Vegetation

The Jones cycladenia, Maguire daisy, and San Rafael cactus all exist in desert habitat within Emery County, Utah. Based upon the geological formations associated with each species and the distance that each species exists from the project area, it is highly unlikely that they exist in the area to be affected by the project.

Wildlife

Threatened or endangered wildlife that have historically occurred, presently inhabit, or seasonally move through the Price and San Rafael River basins include the black-footed ferret, peregrine falcon, and the bald eagle. The long-billed curlew is a candidate species. The Service has identified only the ferret as requiring impact assessment consideration under the Endangered Species Act.

Black-footed Ferret.—The black-footed ferret was listed as endangered in 1967. The animal is the rarest of North American mammals; very little information exists for the black-footed ferret in Utah. The historic range of the black-footed ferret covers substantial portions of Carbon and Emery Counties (Snow, 1972; Scott et al., 1977), but a 1977 survey of potential habitat in the region resulted in no direct observations or location of substantial sign of ferrets (Boner et al., 1977). Moreover, observations of black-footed ferrets in Utah are limited. The only confirmed specimen from Utah was killed 2 miles south of Blanding in the east-central portion of Utah sometime prior to 1952 (Calahane, 1954; Sparks, 1973). One probable sighting of the ferret occurred in the project area between Clawson and Ferron, Utah, in 1980 (Johnson and Anderson, 1981).

Four other probable sightings of black-footed ferrets have been reported from eastern Utah since 1977. A sighting from southern Uintah County was reported in 1979, two additional reports were received from Emery County in 1980, and an additional sighting in Emery County was reported in 1981.

Long-billed Curlew.—The long-billed curlew is found at all elevations, but is rare in southeastern Utah. It is a rare summer resident in the San Rafael Desert. The curlew prefers plains, prairies, and rangelands near water. During breeding season, it commonly perches on bushes, low trees, dirt mounds, rocks, stumps, fence posts, utility poles, or on other elevated sites. It nests in slight hollows on the ground, usually in flat areas among short grasses such as cheatgrass and bluegrass and locates its nests in moist areas or arid areas far from water (Forest Service, 1991).

Fisheries

The Green and Colorado Rivers in eastern Utah are important because they represent the last remaining segment of the Upper Colorado River System that is still undeveloped. More significant, perhaps, is that nearly all the endemic large-river fishes of the upper Colorado River are still represented in these reaches of the Green and Colorado Rivers. These native fish are unique in that 74 percent of them are endemic only to the Colorado River System (Miller, 1959). Four of these endemic fish are listed as endangered—the Colorado squawfish, humpback chub, bonytail chub, and razorback sucker.

Colorado Squawfish.—The segment of the Green River between its confluence with the Price River and its confluence with the San Rafael River is a high concentration area for both adult and juvenile squawfish. This same segment is also a suspected spawning area. The Green River and its tributaries have been identified to receive the highest priority for maintenance and recovery of the Colorado squawfish (Service, 1988).

The Service is in the process of proposing that approximately 620 miles of the Colorado River and its tributaries be designated as critical habitat for the Colorado squawfish. The affected stream sections include the Colorado River from Lake Powell to Grand Junction, Colorado; the Green River from its mouth to the confluence of the Yampa River; the Yampa River from its mouth to about 90 miles upstream; and a short section of the Gunnison River upstream from its junction with the Colorado River.

Only limited data are available concerning the occurrence of Colorado squawfish in the Price or San Rafael Rivers. In 1977, a radio-tagged squawfish was located in the San Rafael River about 3 miles upstream from its confluence with the Green River (Boner, 1977; Hickman, 1983). Another squawfish was located 2 miles above the mouth of the San Rafael River during the summer of 1983 (Hickman, 1983).

Humpback Chub.—The humpback chub is found in isolated areas of the Green, Yampa, Little Colorado, and Colorado Rivers. This endangered fish has been collected both upstream and downstream from the Price and San Rafael Rivers on the Green River and has been identified in Desolation, Gray, and Labyrinth Canyons.

Bonytail Chub.—The bonytail chub is believed to be very rare throughout the Colorado River Basin. Distribution and abundance of this species are difficult to determine because of problems associated with identifying and separating bonytail chubs from other *Gila* species in the Upper Basin. Two bonytail chubs were captured on the Green River above the proposed project area in Desolation Canyon in 1974, and another near Jensen, Utah, in 1978 (Holden, 1978). The Service captured several fish resembling bonytail chubs from Gray Canyon (on the Green River) above the confluence with the Price River in 1980 and 1981; however, only one specimen was tentatively identified as *Gila elegans*. No bonytail chub have been collected in or near the Price and San Rafael Rivers or their confluence with the Green River.

Razorback Sucker.—The razorback sucker is rare in the Green River but has been collected between river kilometer 282-552 and the lower 21 kilometers of the Yampa River. It is believed that although razorback suckers successfully spawn in the upper Green River during the ascending limb of the spring hydrograph, recruitment into the juvenile stage is limited. The adult population is old, and the small number of reproducing fish is population-limiting. Habitat alterations (lower temperatures) and predation by introduced species further limit recruitment.

Comparative Impact Analyses—Endangered or Threatened Species

The most significant potential impact of the action alternatives to area endangered species concerns indirect effects through depletion of flows from the Green River basin, as noted below. Since no endangered species are believed to reside in the project area, under the no action alternative any impacts to habitat or individuals would have to result from changes in water use.

Vegetation

It is not likely that any endangered or threatened plant species occur in the proposed project area. Although no impacts to these species should result from the proposed action, certain precautionary measures would be taken, as noted in the environmental commitments section. The Service concurs that the proposed project would not adversely affect endangered plants.

Wildlife

No impacts to the black-footed ferret are expected to result from this project. The only potential for impact would result from placement of buried pipelines, a new stock pond, or disposal of dredge material within an area occupied by white-tailed prairie dogs, which are the primary food supply of the endangered black-footed ferret. The potential for ferret occurrence is low, and no impacts are anticipated to result from the proposed action. The Service concurs that the proposed project would not adversely affect endangered wildlife. The impact on the long-billed curlew, a candidate species, would be minimal. When installed, the project would still have water in the irrigated area and other habitat elements would be available, although some shift in vegetation types would occur.

Fisheries

Since none of the endangered fish species are found within the Price-San Rafael project area, impact to their habitat or numbers would have to result from changes in water use within the study area. The Service has determined that any depletion of water in the Green River basin would indirectly contribute to the eventual loss of the endangered fishes.

Winter flow in both river systems would revert to a pre-irrigation winter flow pattern without the existing winter water canal use. Water quality in both river systems would be improved slightly by reducing deep-percolation salt-laden water from entering the river. Under the RP plan, lower Price River flows would decrease about 15 percent and the lower San Rafael River would

be reduced by 18 percent. From 19,560 (NED) to 22,460 (RP) acre-feet would be lost annually to the Green River system as a result of the project. Under the NED plan, lower Price River flows would be reduced by 14 percent and San Rafael River flows would be reduced by 16 percent.

No Action Plan

Under the no action plan, total diversions within the study area would be 178,100 acre-feet in an average year. All water owned by UP&L would be used for cooling. The amount of water delivered to farms would be 136,200 acre-feet per year in an average year. Onfarm deep percolation is estimated at 64,670 acre-feet annually. Use of irrigation water for cooling would result in a depletion of 2,000 acre-feet to the Colorado River. Onfarm consumptive use of water would total approximately 54,170 acre-feet annually.

Annual surface return flows would equal approximately 6,460 acre-feet. Without the project, salt loading from agricultural use of irrigation water would equal an estimated 244,000 tons per year, 9,500 tons less than present salt loading in an average year.

SOCIAL AND ECONOMIC CONDITIONS

Description of Existing Conditions

Population

The combined population of the project area from the 1990 U.S. Census was 30,560. Price City in Carbon County is the largest community in the project area with a 1990 population of 8,712.

Castle Dale is the largest community in Emery County with a 1990 population of 1,704. Castle Dale is located about 32 miles south of Price.

The population of the two-county, Price-San Rafael area (Carbon and Emery Counties) has fluctuated considerably over the years (table V-7), in great measure reflecting changes in the local economic opportunities. During the 1950's and 1960's, both Carbon and Emery Counties experienced population declines. Much of the decline of the population during the 1960's came as a result of economic instability. The out-migration of that decade resulted in a net out-migration of 7,240 persons. The migration flow reversed in the 1970's; 4,100 persons immigrated to Carbon County during that period, accounting for 18 percent of the total population by 1980. The sharp increase in population during the 1970's was caused, in part, by the expansion of the energy sector. Immigration was even more important to demographic change in Emery County, where less than 1,500 of the 6,314 person-increase between 1970 and 1980 was due to natural causes. Approximately 4 of every

Table V-7. --Population trends in the State of Utah,
Carbon County and Emery County for 1950 to 1988

Year	State of Utah		Carbon County		Emery County	
	Population	Annualized change rate	Population	Annualized change rate	Population	Annualized change rate
1950	688,862		24,901		6,304	
1960	890,627	2.6	21,135	-1.6	5,546	-1.3
1970	1,059,537	1.8	15,647	-3.0	5,137	-0.8
1980	1,461,037	3.3	22,179	3.6	11,451	8.4
1982	1,563,400	3.5	24,186	4.0	13,494	8.5
1986	1,665,000	1.6	22,700	-1.6	12,220	-2.5
1988	1,695,000	0.9	22,000	-1.5	11,300	-3.8
1990	1,722,950	0.8	20,228	-4.1	10,322	-4.4

Source: From 1950 to 1990, Bureau of the Census; for 1982, 1986, and 1988, Utah State Office of Planning and Budget.

Population projections follow:

	1990	2000	2010
State of Utah	1,768,000	2,004,000	2,443,000
Carbon County	23,300	23,000	28,000
Emery County	11,900	11,800	14,000

Source: *State of Utah Economic and Demographic Projections: 1986*, Utah Office of Planning and Budget, page 16.

10 persons living in Emery County in 1980 had migrated there during the previous decade. During the economic recession of 1982, growth leveled off. The energy decline from 1982 through 1986 has negatively impacted nearly every measure of economic growth in the project counties resulting in net out-migration of population. Net out-migration for the period 1980-86 was 1,800 for Carbon County and 1,200 for Emery County.⁶

In 1988, Utah experienced its fifth straight year of net out-migration. Utah's current trend of out-migration has received significant attention because at no time in the last 40 years has Utah's out-migration continued for more than 4 consecutive years. Furthermore, the out-migration over the past 5 years has been a marked contrast to the previous 15 years when Utah experienced a net in-migration in every year.

Even though the current trend of out-migration causes concern, current conditions suggest that migration out of Utah has peaked. For instance, fewer people left the State in 1988 than in 1987. Furthermore, the current turnaround in the Utah economy has prompted analysts to forecast out-migration in 1989 at less than half the amount in 1988.⁷

Economic Conditions

Based on values of sales of products and receipts from services, industries in 1982 were rated in the following order, from highest to lowest:

Carbon County	Emery County
Mining	Mining
Retail sales	Retail sales
Wholesale trade sales	Service industries
Service industries	Agriculture
Manufacturing	Wholesale trade sales
Agriculture	Manufacturing

Source: *County and City Data Book, 1988*, U.S. Department of Commerce, Bureau of the Census (1982 data) and U.S. Department of Energy, Energy Information Administration, Washington, DC (1982 and 1987 data).

⁶ *County and City Data Book, 1988*, U.S. Department of the Commerce, Bureau of the Census.

⁷ "Utah Data Guide," Utah State Data Center, Utah Office of Planning and Budget, Demographic and Economic Analysis Section, Salt Lake City, Utah, December 1988.

Although the value of coal production decreased by approximately 8.7 percent from 1982 to 1987 in Carbon County and 17.5 percent in Emery County, its relative ranking to other industries remained the same as in 1982.

In 1986, agricultural sales increased by approximately 30 percent over sales in 1982 in Carbon County. The increase in agricultural sales in Emery County was 64 percent for the same period. Although 1986 data has not been published for other sectors of the economy, agriculture is expected to maintain its 1982 relative ranking with other industries.

The 1987 Census of Agriculture lists the following 1986 preliminary cash receipts for livestock, livestock products, and crops. Estimated numbers of livestock on January 1, 1988, are also shown for Carbon and Emery Counties (following page).

As shown in the tabulation, livestock operations are the predominant enterprise found on farms in both counties. Livestock estimates as of January 1, 1988, indicate that beef cattle production is the primary livestock enterprise followed by sheep production. Dairy production comprises a much smaller portion of the area's agricultural production.

The 1987 Census of Agriculture lists 656 farms in Carbon and Emery Counties; 308 operators worked 200 days or more off the farm; 251 farm operators listed farming as the principal occupation. According to the 1987 Census of Agriculture, the total amount of land in farms in Carbon County was 223,549 acres. Four percent (9,050 acres) of that amount is irrigated. In 1987, Emery County had 215,761 acres of land in farms with 18 percent (38,935 acres) irrigated.

	Carbon County	Emery County
1986 sales of livestock and livestock products	\$2.4 million	\$6.8 million
1986 crop sales	0.4 million	1.0 million
1986 estimate ^a for head of livestock:		
All cattle	9,100	28,700
Beef cows	5,500	16,100
Dairy cows	0	600
Stock sheep and lambs	6,100	8,900

Water diverted for irrigation accounts for 80 to 90 percent of the consumptive water use in the area, and annual variations in the acreage of farmlands reflect annual variations in irrigation water availability. Irrigated pasture (grasslands) accounts for about 45 percent (20,700 acres) of the agricultural land with alfalfa grown on about 42 percent (19,320 acres) of the irrigated farmland. Small grains, corn, fruit trees, and potatoes account for the remaining 13 percent (5,980 acres) of the irrigated cropland. Cropping patterns are shown as follows:

	Percentage of acreage by crop ¹				
	Alfalfa	Oat hay	Pasture	Corn silage	Small grain
Price-Wellington	70	20	10		
Carbon	75	20	5		
Huntington-Cleveland	70	15	10	5	
Cottonwood	50	8	40	2	
Ferron	53	17	25	5	
Moore	67			11	2

¹ Based on interviews with local operators, SCS, and Agricultural Stabilization and Conservation Service personnel.

Values and Attitudes

The value structure and attitudes held by the residents of the Price-San Rafael Rivers Unit project area are defined, to some degree, by the region, and individuals engaged in agriculture in the unit area have opted for this lifestyle. Many residents have a strong preference to stabilize the role of agriculture in the area, especially among the communities along the eastern slope of the Wasatch Mountains in Emery County.

The mining sector includes oil and gas extraction as well as coal mining. In Carbon County, it accounts for 50 percent of total labor and proprietor's income (1981), the highest proportion for any county of the State. In Emery County, it accounts for 44 percent. Although the project area overall includes only 2 percent of the State's total population, some 18 percent of the \$316.6 million of the statewide commercial and industrial property in mining is located within the proposed project area.

The lifestyle and aspirations of the inhabitants of the mining communities are somewhat different from those of the agricultural sector. Social change, if associated with economic improvement and growth, may be viewed more positively by the residents of Huntington and Castle Dale where existing and new coal-fired powerplants are planned. But social change has become particularly important to residents of communities such as Price, Sunnyside, and East Carbon City, since they are impacted by the continued and often fluctuating level of production in the mining sector, particularly the coal industry.

Much of the mining activity within the project area consists of coal production. Between 1971 and 1980, production increased on the average of 17.7 percent per annum, peaking in 1982 at 17.6 million tons statewide.⁸ However, in 1983 coal production in the project area fell considerably to 11.8 million tons. There are a number of variables that influence production (i.e., weather conditions, amount of water in reservoirs, temperatures, and others [per. cons. Jahanbaini, Utah State Department of Energy]). The substantial decrease in 1983, however, was, for the most part, attributable to a massive mud earthslide that blocked both rail and highway traffic from the mines to major users. Alternative routes were required until such time as the railways and roads could be reconstructed, and the construction period for these routes was approximately 1 year. Since the reconstruction, however, coal production in the two-county area has shown a steady increase.

The coal mining process has switched from what is known as the "continuous miner" method to a process called "long wall." With this new process, miners produced approximately the same tonnage with nearly 40 percent fewer workers.

Impact Analysis

An analysis of the impacts of the RP, NED, and no action alternatives is presented in the "Social Effects Account" section of the plan selection segment, chapter IV. That analysis indicates no adverse social/economic impacts to the area from either of the action plans.

RECREATION

Description of Existing Conditions

Fishing and camping are the dominant forms of recreation in the Carbon-Emery County area (Utah State University, 1978). Easy access to several national forests, national parks, and the Glen Canyon National Recreation Area probably accounts for the high participation in these outdoor activities.

⁸ Carbon and Emery Counties account for about 95 percent of Utah's total coal production.

There is also significant participation in hunting and driving for pleasure that reflects the nature of the project area's open space environment and availability of recreational resources and opportunities. Activities like golf and tennis are less popular. Use of natural resources is significant by both residents of the proposed project area and nonresidents.

Hunting also plays an important part in the local economy. Upland game species, primarily associated with the irrigated agriculture area, include ring-necked pheasants, cottontails, California quail, and the mourning dove. Hunters spent approximately 25,000 hunter-days afield in 1985 in pursuit of upland game in the proposed project area (Utah Division of Wildlife Resources, 1985). Waterfowl hunting use is low, amounting to fewer than 1,000 hunter-trips per year (Utah Division of Wildlife Resources, 1974). Recreation developments in the area include Huntington Lake State Beach and the recently completed recreation area at Mill Site Reservoir near Ferron. These areas provide camping, boating, and picnicking.

Comparative Impact Analyses

RP and NED Plans

The RP and NED alternatives would generally lead to more efficient agricultural operations with resulting loss of wildlife habitat and some hunting opportunities; the extent of loss would be lower with the NED alternative because it provides surface improvements on 10,050 fewer acres.

Impacts of Off-farm Measures.—The physical impacts of Reclamation's off-farm developments have been discussed at length in vegetation and wildlife sections, and the habitat replacement plan was presented in chapter IV.

These changes would be reflected by changes in habitat suitability for individual game animals using affected sites. As habitat suitability decreased, the number of game animals that could be supported would also decrease. Decreases in game abundance often, but not always, translate into lower hunter interest and fewer days spent afield.

The loss of wetlands and associated wildlife habitat described earlier would adversely affect hunting for pheasants, quail, rabbits, waterfowl, and other wildlife species inhabiting the areas influenced by canal seepage and stockwatering ponds. However, the mitigation plan described for off-farm impacts would replace these losses, resulting in no net reduction of hunting opportunities in the project area.

There would be changes in the location of hunting activity because mitigation lands would be geographically separated from the areas of impact. The proposed mitigation lands would consist of relatively large contiguous areas,

whereas the habitat to be lost is scattered along 7.2 miles of canal and around the numerous stockwatering ponds. Some hunters would probably have to travel further to hunt, while others would have less distance to travel. Additionally, although public access to the canals and ponds on private land is not guaranteed, public access would be assured on project mitigation lands since the areas would be administered by the UDWR. Although replacement acres would be disjunct and concentrated away from the individual impact sites, this arrangement should permit more efficient and effective management.

Fishing and other recreational activities would not be impacted by the proposed project and are not included within the mitigation plan.

In their Coordination Act Report, the Service predicted an impact to wildlife-oriented recreation within the project area of almost \$4 million annually. Some \$2.5 million of this estimate was associated with such nonconsumptive uses as birdwatching. Reclamation and SCS biologists disagree with these estimates and are conducting additional analyses.

Impacts of Onfarm Measures.—The action alternatives would have varied effects on the area's recreational resources. Fishing or camping within the study area should not be affected. Replacement of wildlife habitat lost as the result of SCS onfarm activities would be on a voluntary basis at the discretion of each individual landowner. The SCS would consider all viable actions and make every effort when planning to encourage the individual landowner to preserve, maintain, enhance, or replace vegetation functioning as wildlife habitat. It is anticipated that estimated habitat replacement would be primarily upland habitat, which would maintain and/or benefit existing upland game animals. Although hunting on private lands might be affected during the construction phase, because the area would remain in agriculture-associated habitat, there would not be a significant long-term impact on upland game and big game species.

The Price-San Rafael area is not a major waterfowl hunting area.⁹ Desert Lake and Olsen Reservoir are two major waterfowl areas associated with the irrigated area, and these areas would not be significantly impacted. A detailed analysis for these areas is contained in attachment VII.

No Action Plan

The no action alternative would perpetuate existing conditions as described earlier for the action alternatives. Since the introduction of irrigation into the study area, there has been a gradual loss of crop production to salt buildup in

the soil and water logging and a corresponding shifting from fully irrigated land to partially irrigated land. A no action condition should result in no change in recreational activities such as hunting of game animals that exploit a mosaic of small wetlands, uplands, and croplands.

SCENIC AND AESTHETIC RESOURCES

There is a marked change between the irrigated farmland and the surrounding nonirrigated, semidesert area. Alfalfa is the dominant crop in the irrigated farmland. A wide variety of grasses, forbs, shrubs, and trees occur where irrigation return flows concentrate and in border areas surrounding irrigated farmland. These areas are often wet enough to support wetland vegetation. The surrounding nonirrigated semidesert supports only sparse vegetation.

Comparative Impact Analysis

Under the two action alternatives, scenery within the irrigated farmland segment of the study area would change from a mosaic of scattered wetlands interspersed with croplands and pastures to a predominantly agricultural setting. The physical impacts of onfarm and off-farm developments have been described in vegetation and wildlife sections; disturbed uplands would be recontoured and reseeded, and wetlands impacted by the off-farm portion would be mitigated off site. Under the no action alternative, the pattern of interspersed wetlands, croplands, and pasture would continue.

SOILS, GEOLOGIC, AND MINERAL RESOURCES

Most of the soils in the Price and San Rafael Rivers basins have developed from a marine shale formation (Swenson, J.L., Jr. et al., 1970). These soils are inherently salty and have an almost limitless supply of salt. Current and past irrigation practices have resulted in waterlogging of soils in low-lying areas, causing a rapid increase in salinity buildup on the surface. The nonsaline soils are well-drained soils developed from glacial outwash and alluvium, with textures ranging from medium to coarse. However, these soils are generally shallow over shale.

Although coal mining occurs in the wider project area, none occurs in the area of impact. The geology of the area is characterized by Mancos shale, which underlies the irrigated agricultural area and which is exposed in many of the major tributary channels. Mancos shale is probably the major geologic source of salinity in the area, with more surface area exposed than any other saline-bearing geologic unit. Additionally, streams originating from saline aquifers of the Green River and Colton Formations are generally high in salt concentrations.

⁹ UDWR Evaluation of Existing Wetland Habitat in Utah (F. Clair Jensen, Publication No. 74-14, 1974).

Comparative Impact Analysis

None of the alternatives would appreciably affect geology or mineral resources, and none would adversely impact the soil resource. Under the onfarm component of the action plans, the salt content in the root zone of wet soils and pH would be reduced to make the soil more productive. As irrigation became more efficient and ditches were piped, water tables would be lowered in areas of irrigation-induced wetness, allowing the leaching of salts out of the root zone and deeper into the soil profile, resulting in increased production or reclamation of these areas.

Well-drained soils or soils with adequate drainage would be less affected by this program. The amount of salt leached from the profiles of these soils would be reduced as less irrigation water was applied. The productivity of these soils would not be greatly affected since the greatest concentrations of the salts in these soils is below the rooting zone, or at least in the lower part of the profile.

Under the no action plan, some changes in soils used for agriculture would occur. The areas influenced by subsurface return flows would be lost to agricultural production due to the continued upward migration of salts.

CULTURAL RESOURCES

Description of Existing Conditions

The archeological record of the Carbon-Emery County area indicates past habitation by prehistoric groups. Based on a review of existing information, it is presumed that the area was occupied by Paleo-Indian groups as early as 11,500 years ago. However, the earliest known sites (approximately 8,000 years ago) represent three later and successive prehistoric cultures: the Desert Archaic (7,000-8,000 to about 1,500 B.P.), the Fremont (1,500-600 B.P.), and the Numic-speakers (600-450 B.P.). When white settlers entered this location in the 1880's, the Numic-speaking Utes were living in the area. Historic cultural resources include remnants of early 19th century pioneers and later settlements. Miscellaneous historic features include water control, mining, and farm buildings.

The historic period began when Spanish explorers visited the region looking for precious metals and Indian slaves. The Spanish trail, located south of the route taken by Escalante and Dominguez in 1776, crossed the Green River at the present-day location of Green River, Utah, and continued to Huntington and Cottonwood Creeks in the project area. Anglo-American exploration of the region began with trapping expeditions in the early 19th century when Government explorers entered the area following its acquisition after the Treaty of Guadalupe Hidalgo in 1848.

A class I survey (review of literature and existing data from the Division of State History) was conducted by the MESA Corporation, Orem, Utah, in 1982. This data review revealed that few on-the-ground surveys have been carried out in the project area and that, therefore, relatively few prehistoric sites and almost no historic sites have been recorded. The approximately 1,100 prehistoric sites recorded in Carbon and Emery Counties include scatters of stone tools and chips, rock shelters, open camp sites, masonry structure, tipi rings, and rock art. One hundred and forty-three of these sites are considered to meet the standards of the National Register of Historic Places; 131 have been determined not eligible, and the remainder have not been evaluated.

Consultation with the Utah State Historic Preservation Officer (SHPO), as required by the National Historic Preservation Act, was initiated on January 31, 1989. Seven historic irrigation ditches are to be nominated for inclusion on the National Register of Historic Places.

Paleontological

Paleontological resources that occur in the study area are paleobotanical (plants), invertebrates, vertebrates, and their trace fossils (such as tracks, burrows, excreta, etc.). Important paleontological resources have been observed at the Cleveland-Lloyd quarry maintained by the Bureau of Land Management (BLM) and at other locations throughout the study area.

Comparative Impact Analyses

Of a total of approximately 1,100 sites (prehistoric and historic) located in Carbon and Emery Counties, some may be located within the study area where they could be potentially affected by the project. These lands have not been systematically surveyed for cultural resources. Surveys would be accomplished prior to land-disturbing activities to assure that no prehistoric or historic resources are damaged or destroyed. Among the sites, 143 are considered to meet the standards of the National Register of Historic Places, 131 have been determined to be not eligible, and the remainder have not been evaluated.

RP and NED Plans

The RP alternative proposes to treat 36,050 acres of cropland and the NED alternative 26,000 acres of cropland. Treatment under either action alternative would involve significant construction with associated land disturbances.

Impacts of Off-farm Measures.—Under the action plans, disturbances would occur on the ponds to be lined, borrow areas, access roads, staging areas, and any other locations where earth moving would occur. Abandoned laterals

would eventually be eliminated as structures through nonuse. To assess the significance of the impacts, class III, intensive, on-the-ground surveys would be conducted. In consultation with the Utah SHPO, Reclamation would evaluate all sites to be affected to determine National Register of Historic Places eligibility.

Impacts of Onfarm Measures.—It is not anticipated that the preferred plan would impact any cultural resources. With few exceptions, the SCS would provide assistance on areas that have been disturbed by agricultural operations. It is the policy of the SCS (SCS General Manual, Title 420, Part 401.7, Compliance with Advisory Council on Historic Preservation) that as each individual landowner applies for technical assistance, SCS would coordinate with the SHPO. A reconnaissance of the area would be conducted by SCS personnel, and if cultural resources were identified, appropriate action under the policy would be taken.

No Action Plan

Land retirement due to population growth is not expected to be a major factor in projections of future conditions without the proposed project; accordingly, cultural resources impacts without the project would be essentially unchanged.

CUMULATIVE IMPACTS

Reclamation

Introduction

The following discussion addresses the proposed project's role in the assumed cumulative impacts to area resources. The NED and RP plans are not treated separately because their impacts would differ only in magnitude, as discussed in previous sections. Any analysis of cumulative impacts must deal with the issue of scope, both in terms of spatial and temporal scales. In the following discussions, these scales will vary depending upon the resource under evaluation.

Resources Considered but Not Evaluated

Since 1960, some 29 water resources projects have been built or are under construction by Reclamation in the Upper Colorado River Basin (table V-8). Reclamation estimates that these projects have provided full irrigation service to 158,460 acres with supplemental service to another 204,870 acres. These developments account for an estimated 62,776,000 megawatt-hours of power generation and some 431,100 acre-feet of municipal and industrial water

Table V-8. --Developments included in cumulative impact analysis

Development and location (State)	Actual or estimated completion date
Colorado River Storage Project (CRSP) storage units	
Wayne N. Aspinall Unit, Colorado	1977
Flaming Gorge Unit, Wyoming and Utah	1963
Glen Canyon Unit, Utah and Arizona	1965
Navajo Unit, Colorado and New Mexico	1963
CRSP participating projects	
Florida Project, Colorado	1963
Paonia Project, Colorado	1962
Silt Project, Colorado	1966
Smith Fork Project, Colorado	1963
Hammond Project, New Mexico	1975
Central Utah Project, Utah	
Bonneville Unit	1992
Jensen Unit	1989
Vernal Unit	1961
Upalco Unit	1990
Emery County Project, Utah	1965
Lyman Project, Wyoming	1980
Seedskadee Project, Wyoming	1
Navajo Indian Irrigation Project, New Mexico	1987
San Juan-Chama Project, New Mexico	1976
Bostwick Park Project, Colorado	1971
Dallas Creek Project, Colorado	1989
Dolores Project, Colorado	1990
Fryingpan-Arkansas Project, Colorado	1977
Grand Valley Unit, Colorado (Colorado River Basin Salinity Control Project)	2006
Pardox Valley Unit, Colorado (Colorado River Basin Salinity Control Project)	1990
Animas-La Plata Project, Colorado and New Mexico (CRSP)	1997
Ruedi Reservoir Round 2 Water Sale, Colorado (Fryingpan-Arkansas Project)	1986
Lower Gunnison Basin Unit, Colorado (Colorado River Water Quality Improvement Program)	1995
Uinta Basin Unit, Utah (Colorado River Water Quality Improvement Program)	1998
Dolores Project Modifications	1996

¹ Fontanelle Dam and Reservoir were completed in 1964. Irrigation development has been deferred indefinitely.

supplied. Recreational use associated with these projects, including sightseeing, picnicking, camping, fishing, hunting, and other activities, is estimated at 45,068,970 annual recreation days. In terms of average annual permanent employment opportunities, these projects are responsible for some 18,716 jobs.

The Price-San Rafael Unit would not affect the above resources. No new acres of cropland would be irrigated and no new power would be generated; it is assumed that there would be no net change in recreational opportunities, and no new permanent jobs would be created. Because there would be no net change in existing levels of these resources, it is assumed that there would be no cumulative impact from the proposed project and it has been determined that further analysis of cumulative impacts is not necessary.

Cumulative Resource Issues

Several resource issues have been affected by past Reclamation developments and would be affected by the proposed project; they thus have the potential to contribute to cumulative (additive) impacts within the region and beyond. These issues involve cover-type conversions in which some type of wildlife habitat is usually lost, stream depletions that can impact fisheries and endangered native fishes, and changes in salt loading within the Colorado River. These issues are treated below under the headings of vegetation, fisheries, threatened and endangered species, and water resources, use, and quality.

Vegetation.—Impacts to vegetation and the wildlife habitat it provides are generally project specific; therefore, this analysis has been limited in spatial scope to the Upper Colorado River Basin. Changes in five broad types of vegetation—riparian, aspen-conifer, pinyon-juniper, grassland, and cropland-pasture—are presented in table V-9 for 26 Reclamation projects in the Upper Basin. Changes in these vegetation types can be used as an index to change in the region's wildlife habitat. The limited data available on wildlife abundance in the Upper Colorado River Basin make it impossible to estimate changes in local populations that may be associated with development of Reclamation projects over the last 30 years. It is, however, logical to assume that in general, fewer acres of habitat would support fewer numbers of wildlife. Although the area affected may appear small in terms of habitat available in the Upper Basin States, local populations can be significantly impacted by project development.

The temporal scope of impacts to vegetation and wildlife habitat has been limited to the past 30 years and estimates of trends likely to continue in the future. The Price-San Rafael Unit would impact grasslands and cropland-pasture from table V-9, as well as wetlands (not shown). The actual acreages of change have been discussed previously for both the NED and RP plans. Large developments for new irrigation are unlikely to continue in the future.

Table V-9—Major terrestrial wildlife habitat changes from Reclamation developments (units—acres)

	Riparian ¹	Aspen-conifer	Desert shrub, brushland, pinyon-juniper ²	Grassland	Cropland-pasture ³	Specific wildlife developments
Key habitat in Upper Colorado River Basin ⁴	200,000	6,648,900	29,987,300	1,064,700	3,720,700	Not determined
CRSP changes ⁵						
Wayne N. Aspinall Unit	-430	-1,010	-6,000	-270	-2,070	7,620
Fleming Gorge Unit	1,730	-800	-34,970		-940	7,530
Glen Canyon Unit ⁶	-90		-2,930			7,530
Navajo Unit	-150		-12,190		-4,000	3,060
Florida Project	-10	-100	-5,930	-300	5,730	
Paonia Project	-5		-2,430	-100	2,230	
Silt Project	-10	-15	-2,320		1,920	
Smith Fork Project	-10		-1,590		1,290	
Hammond Project			-3,030		3,900	
Central Utah Project						
Bonneville Unit Collection System	-105	-412	-4,590	-4,213		23,260
Jensen Unit	-40		-680	-230	380	500
Vernal Unit			-580		-300	600
Upaloo Unit	-450	-100	-700	-50	-50	160
Emery County Project	-10		-2,160		770	2,030
Lyman Project	-260		-3,660	-260		1,880
Seedskaadee Project	-2,860				-2,310	22,000
Navajo Indian Irrigation Project			-100,000		100,000	
Bostwick Park Project		-20	-1,400	-190	1,320	
Dallas Creek Project	-100		-920		-600	1,160
Dolores Project	-870		-2,500	-8,800	4,900	9,050
Fryingpan-Arkansas Project changes	-200	-100			-840	
Grand Valley Unit	-790		-1,177		1,000	2,090
Paradox Valley Unit	750		-3800	200		3,700
Animas-La Plata Project	-550	-420	-5,953	-3,246	18,310	3,500
Lower Gunnison Basin Unit	-2,547					2,100
Uinta Basin Unit	-609		384		200	610
Dolores project modifications	-304					770
Total remaining habitat in basin	188,371	6,645,923	29,776,984	1,047,241	3,851,540	90,850
Percent change	-2.4	-0.01	-0.04	-0.3	+0.5	+16.4

¹ Data on quantity of riparian habitat are scarce. Habitat losses were estimated on the basis of miles of stream inundated, with the exception of Fleming Gorge, Wayne N. Aspinall, and Glen Canyon Units where habitat figures were available from preimpoundment studies.
² Includes pinyon-juniper woodland, mountain brush, salt desert shrub, and northern and southern desert shrub types.
³ Net change.
⁴ Derived from the 1971 Upper Colorado Region Comprehensive Framework Study (1965 data) adjusted to reflect habitat changes due to CRSP units constructed prior to 1965.
⁵ Figures shown are estimates for land either inundated or placed under full service irrigation.
⁶ A total of 113,290 primarily barren acres was inundated at Glen Canyon; of these, only 3,020 were considered key habitat.

Rehabilitation of existing systems and new salinity reduction projects will likely continue and become the most common type of project in some areas in the future. These projects will continue to impact irrigation-dependent wetlands.

Fisheries.—The spatial scope of impacts to fishery resources in the current study is defined in part by interstate compacts for the delivery of prescribed amounts of water to the Lower Basin States via releases from Lake Powell. Within the Upper Basin, the cumulative impacts of several projects may be most significant at the level of individual drainages. For example, flows in Ferron Creek have been depleted by earlier projects. The proposed Price-San Rafael Unit would remove up to 50 percent of the remaining water. The significance of these removals to species such as the roundtail chub is unknown.

Many of the impacts to fishery resources from the 29 Reclamation projects in the Upper Basin are the direct result of stream inundation or temperature alterations and water depletions. Because no reservoirs are proposed for the Price-San Rafael project, no new stream reaches would be inundated or have their temperature regimes altered. Depletions would occur, however, and are discussed below.

Threatened and Endangered Species.—The same argument used for spatial scope for fisheries resources applies to endangered native fishes—the Upper Basin is a discrete water unit. The Colorado squawfish, bonytail chub, and the humpback chub are endemic to the Colorado River Basin including downstream portions of the Green, Yampa, Gunnison, San Juan, and Colorado Rivers. These species evolved in the Colorado River and its larger tributaries under conditions of warm water, large seasonal flow fluctuations, heavy sediment loads, extreme turbulence, and a wide range of dissolved solid concentrations. These conditions have been altered by man's activities, and all three species have experienced population declines. Below Glen Canyon Dam, approximately 15 reservoirs have controlled and altered the lower Colorado River to the point that the three species are rare or nonexistent.

In the Upper Colorado River Basin, the Colorado squawfish and bonytail and humpback chubs historically occupied some 1,350 miles of stream. Developments have inundated 364 miles of fish habitat and modified temperatures in 448 additional miles of stream (table V-10). The Glen Canyon Unit flooded 186 miles of streams in the Upper Basin and altered flow, temperature, and water quality in the 293 miles of Colorado River that flow through Marble and Grand Canyons. Although this reach was once considered significant native fish habitat, only a remnant population of humpback chub remain in the river between Lakes Powell and Mead. Navajo Reservoir on the San Juan River and Flaming Gorge Reservoir on the Green River inundated 72 and 137 miles of native fish habitat, respectively.

Table V-10. Loss of river habitat for endangered fish species
in Upper Colorado River System from Reclamation developments
(unit—miles)

Project and river	Elimination by inundation	Loss due to water quality change	Total
Wayne N. Aspinall Unit Gunnison River		50	50
Flaming Gorge Unit Green River	72	65	137
Glen Canyon Unit Colorado River	186	293	479
San Juan River	71		71
Navajo Unit San Juan River	35	40	75
Total	364	448	812

Known endangered fish habitat			
Development	Feature	Location	Miles from project
Grand Valley Unit	Irrigation system improvements	Colorado River at Grand Junction, Colorado	0
Paradox Valley Unit	Brine well field	Colorado River at mouth of Dolores River, Utah	75
Animas-La Plata Project	Ridges Basin and Southern Ute Reservoirs	San Juan River near Aneth, Utah ²	100
Ruedi Reservoir Round 2 Water	Sale of reservoir water	Colorado River at Grand Junction, Colorado	120
Lower Gunnison Basin Unit	Irrigation system improvements	Gunnison River downstream from Delta, Colorado	15
Uinta Basin Unit	Irrigation system improvements	Green River above and below mouth of Duchesne River, Utah	25
Dolores Project Modifications	Irrigation system improvements	San Juan River confluence with McElmo Creek	40

¹ Altered habitat in Lower Basin caused by Glen Canyon Dam

² One juvenile squawfish collected in 1976.

The dams and reservoirs associated with the Wayne N. Aspinall Unit on the Gunnison River did not directly impact endangered fish habitat but may have indirectly affected downstream areas through changes in temperatures and flow.

Because of the potential for cumulative impacts from Reclamation projects, the Service requested Section 7 consultation (Endangered Species Act) for various Colorado River Basin native fishes in 1980, on virtually all developments constructed, under construction, or in advanced planning stages. Consultation was made contingent on completing fishery studies funded by Reclamation. Study goals included collection of data to support actions that would ensure continued existence of the fishes, while permitting orderly development of water resources for various States. Subsequently, several developments have received nonjeopardy opinions—the Animas-La Plata Project; the Lower Gunnison Basin, Paradox Valley, Grand Valley, the Uinta Basin Units; and the Dolores Project modifications. In 1990, the Service reversed itself and declared that construction of the Animas-La Plata Project would jeopardize the existence of a small population of Colorado squawfish downstream from the project site. The Service called for further study, and the issue remains unresolved at this time. The Service has not provided an opinion on Reclamation's biological assessment of impacts associated with construction of the Price-San Rafael Salinity Control Project.

Projects that have not directly inundated endangered fish habitat may have indirectly affected endangered fishes through depletions of mainstream flows and changes in water quality (table V-11). Although salinity reduction projects often result in water saved, the Price-San Rafael Unit would result in further depletions to the Green River and ultimately the Colorado River.

Water Resources, Use, and Quality.—During the last decade, Reclamation developed the Colorado River Simulation System (CRSS) model to improve estimates of individual and cumulative impacts from developments on salinity and requirements for future salt load reductions. One conclusion from the CRSS analysis is that hydrologic uncertainty cannot be reduced or simplified. The Colorado River Basin hydrologic record shows numerous wet and dry periods which cause the salinity in the river to vary by as much as 200 mg/L from average conditions. These fluctuations tend to mask the impacts of both development and salinity control projects.

Given these limitations, historical and projected data can be used to estimate a range of salinity effects at Imperial Dam (table V-11). The range is due to effects from other developments on flow and salinity. The cumulative impact of the developments listed may be more than 200 mg/L. Nearly one-third of the increase is attributable to depletions caused by reservoir evaporation, but these reservoirs also tend to stabilize the riverflow and thereby reduce the seasonally high salinity that formerly occurred in the Colorado River.

Table V-11. Stream depletions and salinity changes

Project or unit	Depletions (acre-feet/year)	Change in salt loading (tons/year)	Range of individual project salinity impacts for 1941-2040 ¹ (mg/L)	
			Minimum	Maximum
Wayne N. Aspinall Unit	9,000	0	0.4	1.7
Flaming Gorge Unit	65,000	0	2.6	12.1
Glen Canyon Unit	525,000	0	20.8	91.2
Navajo Unit	26,000	0	1.1	4.9
Florida Project	14,000	11,500	1.1	4.1
Paonia Project	10,000	4,700	.6	2.5
Silt Project	6,000	13,200	.8	2.8
Smith Fork Project	6,000	2,800	4	1.5
Hammond Project	10,000	7,900	.7	2.9
Central Utah Project				
Bonneville Unit	166,000	-21,600	5.8	27.7
Jensen Unit	15,000	33,200	2.0	7.1
Vernal Unit	12,000	27,700	1.7	5.9
Upalco Unit	12,000	6,200	.8	3.1
Emery County Project	8,000	0	.3	1.5
Lyman Project	10,000	0	.4	1.9
Seedskadee Project	281,000	0	11.3	50.6
Navajo Indian Irrigation Project	267,000	220,000	20.0	75.7
San Juan-Chama Project	110,000	-16,000	3.8	18.3
Bostwick Park Project	4,000	11,200	0.6	2.2
Dallas Creek Project	17,000	9,800	1.1	4.5
Dolores Project	81,000	50,650	5.4	21.5
Fryingpan-Arkansas Project	69,000	-3,500	2.7	12.4
Paradox Valley Unit	1,500	-180,000	-7.7	-23.2
Animas-La Plata Project	155,000	6,470	6.0	27.6
Ruedi Reservoir Round 2 Water Sale	49,000	-15,000	1.3	7.3
Lower Gunnison Basin Unit	-2,000	-141,000	-6.1	-18.7
Grand Valley Unit	0	-166,000	-7.2	-21.7
Uinta Basin Unit		² 25,500	-1.1	-3.3
Dolores Project Modifications		-32,000	-1.4	-4.2
Total	1,926,500	-208,810	⁽³⁾	⁽³⁾

¹ Maximum annual range of salinity impact at Imperial Dam as predicted by the CRSS computer model developed by Reclamation. The range of effects considers the uncertainty of the hydrosalinity analysis as well as a wide range of hydrologic and development conditions. The maximum annual range represents the widest variation in salinity impacts possible by a project in any 1 year of operation. The average impact would fall approximately midway between these extremes.

² Mean of 21,000 to 30,000 tons of reduction expected from unit.

³ Salinity impacts of the individual developments cannot be added directly because of synergistic effects.

U.S. Department of Agriculture

Under USDA salinity control projects for which environmental impact statements have been completed (table V-12), there will be a reduction of 632,600 tons of salt per year in the Colorado River System. In all, 12,156 acres of emergent wetland and 11,431 acres of scrub-shrub and forested wetlands may be converted to upland when all work is completed.

Table V-12.—USDA Colorado River Basin Salinity Control Program

	Begin implemen- tation	Projected date complete	Projected total reduction (tons/yr)	Salt reduction to 9/30/90 (tons/yr)	Cost effective- ness (\$/ton)
Grand Valley (USDA)	1979	2000	163,000	39,100	27
Uinta Basin (USDA)	1980	2003	98,200	45,000	80
Big Sandy River (USDA)	1988	1996	52,900	4,900	27
Lower Gunnison 1 (USDA)	1988	2005	82,100	2,000	64
Lower Gunnison 2, Montrose (USDA)	1991	2008	81,700		68
Lower Gunnison 2, Delta (USDA)	1991	2004	104,700		41
McElmo Creek (USDA)	1990	1999	38,000	500	83
Lower Gunnison 3 (USDA)	1992	1995	12,000		74

USDA projects other than Price-San Rafael do not show a depletion of return flow to the river. Therefore, there should be no additional impact on the river's fisheries.

Within the Price and San Rafael Rivers basins, the only existing USDA project is the Ferron Watershed. As noted in chapter I, SCS' Ferron Watershed Project, constructed in 1965, includes: eight debris basins; a livestock pipeline (to replace use of Ferron Creek for livestock water); and Mill Site Dam. Three reservoirs in the upper watershed (Duck Fork, Willow Lake, and Ferron) were converted from irrigation storage to fisheries. About 10 percent of the Ferron irrigation system was converted from earth ditches to pipeline. The Forest Service treated the upper watershed to improve vegetative cover.

As a result of the Ferron Watershed Project:

- Aquatic habitat has been increased 2,345 acre-feet because of the conservation pool in Mill Site Reservoir and maintenance of the other reservoirs by the Division of Wildlife Resources as fisheries. (These

three existing reservoirs were previously drawn down as far as possible during the hot summer months for irrigation, causing fishkills. Since construction of Mill Site Reservoir they have been maintained for fish.)

- Flat water fishery has been increased by 566 acres as a result of Mill Site Reservoir and maintenance of the other three reservoirs.
- Water quality has been improved by structures and by land treatment in the upper watershed to reduce erosion and sediment. Before treatment of the upper watershed, the sediment and debris deposited in the creek channel by summer storms were moved out by snowmelt the following spring. Improved cover has decreased sediment, and Mill Site Reservoir catches any remaining sediment from the upper watershed. Eight debris basins protect peripheral areas.
- The livestock pipeline has kept cattle out of Ferron Creek and has kept the water out of canals in the winter, thereby decreasing deep percolation and the resulting salt load.
- Before construction of the Mill Site Reservoir, Ferron Creek was often dry in the late summer months. Although water turned into the creek is still limited in late summer, there is irrigation return flow for a longer time because stored water permits a longer irrigation period.

Chapter VI
CONSULTATION AND COORDINATION

CHAPTER VI
CONSULTATION AND COORDINATION

PUBLIC INVOLVEMENT

Over the course of the study for the Price-San Rafael Rivers Unit, a number of methods were used by the Bureau of Reclamation (Reclamation) and the Soil Conservation Service (SCS) to elicit public comment and involvement in the planning process, including meetings, other briefings, and mailings, as indicated on the accompanying public participation summary, table VI-1.

This chapter and the plan formulation chapter will serve as the Public Involvement Summary Report for this phase of activity on the Price-San Rafael Rivers Unit.

Public Meetings

Among meetings held at various points in the planning process were the following:

- May 19 and 20, 1981, in Price and Castle Dale, Utah.—In these scoping meetings, Reclamation and SCS staff members defined the study plan of both agencies and collected related concerns and comments from area residents.
- April 14, 20, 21, and 23, 1982, in Price, Huntington, Castle Dale, and Ferron, Utah.—In these meetings, study progress and alternative developments were addressed by Reclamation and Reclamation contractor CH₂M-Hill, SCS staff, Soil Conservation District (SCD) officers, and local water users and irrigation company officials.
- June 8 and 9, 1983, in Price and Castle Dale, Utah.—Alternative on-farm and off-farm plans and related information were discussed by water users association directors, irrigation company directors, SCD supervisors, SCS staff, and representatives from municipal and special district water systems.
- December 2 and 3, 1987, Castle Dale and Price, Utah.—Information was presented on the Price-San Rafael Salinity Project, cost sharing, low-interest loans, and the winter livestock water program. Letters of support were elicited to assist in determining the level of continued support for the project.

Table VI-1. Public participation summary

Meeting participants or event	Purpose	Date
Newsletters	Information	April, October 1979
Newsletters	Information	April, October 1980
Newsletters	Information	April 1981
Letter sent to Federal Register	For publication of scoping meeting	April 21, 1981
Newsletter	Announcing public meeting	May 5, 1981
Federal Register Notice	Public scoping meeting	May 8, 1981
SCS-Reclamation	Scoping meeting - Price	May 19, 1981
SCS-Reclamation	Scoping meeting - Castle Dale	May 20, 1981
SCS-planning team meeting	Coordination	Nov. 16, 1981
SCS-Reclamation	Formation of interagency team	Dec. 4, 1981
Newsletter	Information	February 1982
SCS-Ferron Irrigation Co.	Alternatives	April 14, 1982
SCS-Cottonwood Irrigation Co.	Alternatives	April 20, 1982
SCS-Huntington Irrigation Co.	Alternatives	April 21, 1982
SCS-Carbon Canal Co.	Alternatives	April 23, 1982
SCS-Price/Wellington Canal Co.	Alternatives	April 23, 1982
SCS-Reclamation public meetings	Alternatives	June 8-9, 1983
SCS public meeting	Preferred plan	Nov. 15-16, 1985
SCS public meeting	Scoping	1984
SCD's sponsored tour	Uinta Basin Salinity Program	1984
SCS public meeting	Information update	July 15-16, 1986
SCS-Reclamation-Irrigation Company's-SCD's-Utah Division of Water Resources	Coordination and alternatives	April '83, 1987
SCS-Reclamation	Coordination	May 14, 1987
SCS-Reclamation	Coordination	June 1-2, 1987
SCS-Reclamation public meetings	Alternatives	Dec. 2-3, 1987
SCS-Reclamation	Memo of under- standing	April 13, 1988
SCD's sponsored tour	Uinta Basin Salinity Program	1988

Table VI-1.—Public participation summary (continued)

Meeting participants or event	Purpose	Date
SCS-Reclamation	Coordination	June 20, 1988
SCS technical meeting	Coordination	June 20, 1988
SCS public meeting	Information	1988
SCS-Reclamation-forum, etc.	Depletion/alter- natives/impacts	March 14, 1989
SCS-Reclamation-Environmental Protection Agency-Fish and Wildlife Service	Alternatives and impacts	March 15, 1989
SCS-Reclamation	Salt budgets and wildlife	May 11, 1989
SCS-Reclamation newspaper article and letters	Announce public meetings	May 1989
SCS-Reclamation public meetings - Castle Dale/Price	Alternatives	June 5-6, 1989
Castle Valley Special Service District	Information	Sept. 11, 1989
Cottonwood Creek	Information	Sept. 13, 1989
Cottonwood Creek	Alternatives	May 2, 1990
Salinity Forum Tour	Coordination	Sept. 17, 1990
Cultural Resource Meetings	Information	June 27, 1991
Carbon County Commissioners	Information	Sept. 16, 1991
Night meeting in Price	Information	Oct. 16, 1991
Carbon County Hearing	Coordination	Nov. 12, 1991
Emery County Hearing	Coordination	Nov. 13, 1991
Huntington/Cleveland Stockholders	Information	Nov. 20, 1991
Spring Glen Water Users	Information	Nov. 20, 1991
Ferron Stockholders	Information	Nov. 26, 1991
Carbon Area Water Users	Information	Nov. 27, 1991
Cottonwood Creek Water Users	Information	Nov. 27, 1991
UDWR sponsored meeting	Information	July 7, 1992
SCD sponsored tour	Grand Junction Salinity Program	July 15-17, 1992
SCD sponsored tour	Price-San Rafael	Sep. 2, 1992
Local Salinity Coordinating Committee	Coordination	Sep. 28, 1992
Local Salinity Coordinating Committee	Coordination	Jan. 5, 1993
Local Salinity Coordinating Committee	Coordination	Feb. 8, 1993
Local Salinity Coordinating Committee	Coordination	April 16, 1993
SCD sponsored tour	Salinity control demonstration	July 29, 1993

- June 5 and 6, 1989, Castle Dale and Price, Utah.—Public meetings were conducted, and it was emphasized that letters supporting whichever onfarm alternative was preferred must be submitted by June 30, 1989, by such organizations and individuals as irrigation companies, SCD's, county commissions, and water conservancy districts. The original June 20, 1989, submission date was extended 10 days to permit a field tour of the Uinta Basin Salinity Program on June 23, 1989, and the preferences expressed in the letters were taken into account in selecting the preferred plan. While the overall salinity control program was discussed in the meeting, emphasis was placed on the onfarm component. Included were problems associated with the area as the problems related to salinity, proposed alternatives to alleviate the salt-loading problem, economic and environmental impacts of the proposed alternatives, and other issues.

Newsletters

Mailings were prepared by the SCS salinity study team and mailed to interested parties in April and October 1979; April and October 1980; April 1981; and February 1982. Other correspondence was conducted by Reclamation on an ongoing basis in the study period.

SUPPORT FOR THE STUDY

Several water quality legislative acts have been passed that became significant to the Price-San Rafael Rivers Unit salinity control investigations, as noted in part in chapter I. The Water Quality Act of 1965 (Public Law 89-234) (the Act) established the Federal Water Pollution Control Administration, which later became part of the Environmental Protection Agency (EPA). This agency provides grants for research and development and requires the establishment of water quality standards and other pollution-related remedies. The Act also required States to adopt water quality criteria applicable to interstate waters.

The seven Colorado River Basin States, in an effort to establish water quality standards, found that because of legal and institutional constraints, combined with a lack of technical knowledge of salinity control and management, it would be extremely difficult to establish workable numerical salinity standards on the Colorado River. Water quality standards which did not include salinity standards were therefore developed.

The Federal Water Pollution Act Amendments of 1972 (Public Law 92-500) required that numerical standards for salinity be set on the Colorado River. In response to these requirements, the Basin States in 1973 established the Colorado River Basin Salinity Control Forum (Forum), which includes water

resource and water quality representatives appointed by the governors of the Basin States. The Forum has worked with the EPA and Reclamation to develop a program for controlling salinity in the Colorado River.

In order to comply with EPA's regulations on formulation and adoption of Colorado River salinity standards published in December 1974, the Forum developed uniform salinity standards and a plan of implementation. The States have adopted and submitted these to the EPA and, through the Forum, have maintained a keen interest in the salinity control program.

Additional support has been offered by water user groups in the Price-San Rafael Unit area. Included among these are the major irrigation companies in the area, local soil conservation districts, and other entities. Support from Cottonwood Creek Consolidated Irrigation Company is contingent on improving the company's livestock watering system to make it functional and having storage space for the entity's primary water in Joes Valley Reservoir on a space-available basis. Both issues are addressed in the preferred plan.

Support has been expressed by Ferron Canal and Reservoir Company, Price River Watershed SCD, Emery County Agricultural Stabilization and Conservation (ASC) Committee, Carbon County ASC Committee, Price River Distribution System, Carbon Canal Company, Price-Wellington Canal Board, Huntington-Cleveland Irrigation Company, Cottonwood Creek Consolidated Irrigation Company, and San Rafael SCD.

CONSULTATION AND COORDINATION

Coordination between the U.S. Department of Agriculture (USDA) and U.S. Department of the Interior (Interior) is mandated under Title II of the Colorado River Salinity Control Act (Public Law 93-320), as discussed in the study authority section of chapter I. Additional coordination and consultation were carried out with other Federal, State, and local entities, including the Utah State Historic Preservation Office.

For purposes of the present study, Reclamation focused its expertise on such off-farm problems as canal seepage, while SCS emphasized onfarm irrigation efficiencies through improved water management for a broad-based, problem-solving approach.

Interior/USDA

A memorandum of understanding between Interior and USDA, effective November 27, 1974, was executed under the authority of the Interdepartmental Work Service Act of March 4, 1915 (35 Stat. 1084), as amended; the Economy Act of June 30, 1982 (31 U.S.C., Sec. 686); and the Colorado River Basin

Salinity Control Act of June 24, 1974 (88 Stat. 266). In addition, a memorandum of agreement, effective March 27, 1975, was executed between Reclamation and the SCS to implement the specific cooperative activities mandated under Title II of the Salinity Control Act. Under Title II, Interior and the USDA are to coordinate activities involving the improvement of irrigation efficiencies in irrigated areas that are sources of salinity in the Colorado River system and to jointly plan and implement salinity control measures.

Other Federal, State, and Local

Coordination for the project occurs at several levels of government. Salinity control requires efforts of Interior, including the Fish and Wildlife Service (Service), U.S. Geological Survey (USGS), Bureau of Land Management (BLM), and Reclamation; the EPA; and the USDA, including the SCS, Agricultural Stabilization and Conservation Service (ASCS), Agricultural Research Service (ARS), Cooperative State Research Service, and the Extension Service. Capabilities of the Federal agencies are coordinated through an Interagency Salinity Control Committee to improve management of irrigated agriculture through research and onfarm improvements and to implement selected structural and nonstructural control measures.

As noted, the Colorado River Basin States jointly seek to reduce salinity in the Colorado River through the Forum and the Colorado River Basin Salinity Control Advisory Council, which help to shape Reclamation policy and planning. Coordination of USDA activities at the various levels of government was accomplished through the USDA SCS Salinity Study Team, an interdisciplinary team made up of the State Conservation Engineer's staff and State Resource Conservationist's staff, Salt Lake City, and the Price Field Office staff in Price and Castle Dale, Utah. Other USDA agencies were consulted, including the ARS, ASCS, Forest Service, and Cooperative Extension Service.

Overall project coordination was accomplished through the Interagency Planning Team organized by Reclamation for the Price-San Rafael Rivers Unit. Other members included: SCS, the Service, BLM, Southeastern Utah Association of Governments and Economic Development District, Utah Division of Health, Utah Division of Water Resources (UDWR), Utah Department of Agriculture, and Utah Field Advisory Committee.

U.S. Fish and Wildlife Service

In its approach to riparian/wetland habitat mitigation, Reclamation has coordinated closely with the Service in developing alternatives, including the preferred plan. The Service's Fish and Wildlife Coordination Act Report describes existing vegetation and wildlife conditions, evaluates what effect construction of the preferred plan would have on these resources, and

recommends specific mitigation measures to compensate for the adverse effects of the project. The Coordination Act Report is presented as an attachment to this document.

Interagency coordination in this area is particularly significant, since habitat which has developed as a result of irrigation system losses is an important resource. This habitat, in an area otherwise devoid of significant vegetation, provides cover and food for small mammals and birds. As a result, any reduction in wildlife habitat associated with improving irrigation systems for salinity control raises concerns from the Service and UDWR.

The Service has supplied a Coordination Act Report and a biological opinion on potential impacts of the proposed project to threatened and endangered species. The proposed project would not jeopardize the continued existence of any species originally identified as threatened or endangered. In order to offset potential impacts to nonendangered wildlife and their habitats, the Service has provided the following recommendations. These recommendations are followed by the joint responses from Reclamation and SCS.

1. **Recommendation:** In order to partially offset wetland losses, the Service recommends the fee title purchase of 12,384 acres of flood plain lands in the drainages of Cottonwood, Ferron, Huntington, and Willow Creeks, and the San Rafael River. The Service also recommends that water, water distribution systems, access roads, and fences be provided to facilitate management.

Response: Reclamation would purchase in fee title 380 acres and develop 330 acres of wetlands for eventual transfer to the UDWR for management. This wetland development would replace in-kind total losses projected for off-farm construction activities.

Replacement of wildlife habitat values lost to onfarm activities would be on a voluntary basis by individual landowners. Worst-case losses are projected at 5,261 acres at full implementation. Of sites technically classified as wetlands, 77 percent occur in agricultural fields. Of these wetlands, 88.8 percent are pasture/haylands that are routinely disturbed by mowing and grazing. Another 8.1 percent are classified as grass/sedge that are also disturbed by farming practices. Reclamation and SCS wildlife biologists believe the existing hydrologic regimes and land management practices that apply to these lands dictate their wildlife habitat functional values as uplands rather than traditional wetland values. The replacement of these sites with sites possessing wetland wildlife functional values in the recommended amounts would therefore be both unjustified and excessive.

2a. **Recommendation:** The Service recommends that a 2-year study be conducted on the status of roundtail chub populations in streams within the project area. The proposed study would cost an estimated \$102,700.

Response: USDA does not agree that there would be a significant impact on the roundtail chub.

2b. **Recommendation:** The Service recommends that water rights be purchased in quantities sufficient to maintain streamflows at existing levels in occupied roundtail chub habitat in Huntington, Ferron, and Cottonwood Creeks, and in the Price and San Rafael Rivers.

Response: In Utah, instream flow rights can only be held by a Government agency. At present, all streams in the proposed project area are overappropriated. Any water rights for fish habitat would have to be purchased from the current owners. Reclamation and the Service are currently discussing this recommendation.

3. **Recommendation:** All upland habitat disturbed during construction should be reseeded or replanted with native plant species and monitored until satisfactorily reestablished.

Response: Reclamation agrees and would rehabilitate 457 acres of upland habitat temporarily disturbed during construction. USDA participants will be given technical and financial assistance to carry out revegetation of disturbed sites.

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- II. Glossary and Species List
- III. Biological Assessment
 Supplemental Biological Assessment
 Fish and Wildlife Coordination Act Report
 Biological Opinion
- IV. Cultural Resources Consultation
- V. Environmental Commitments and Compliance
- VI. Economics
- VII. Project Impacts (SCS) on Wetlands and Wildlife
 Habitat
- VIII. Evaluation of Impacts of Alternative Plans on the
 Roundtail Chub
- IX. Hydrosalinity Analysis
 Flow diagrams
- X. Framework Plan for Monitoring and Evaluating
 the Colorado Salinity Control Program
- XI. Comments and Responses on the Planning
 Report/Draft Environmental Impact Statement

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ATTACHMENT II

Glossary Species List

GLOSSARY

Automatic Water Control Valve - A water control device placed in an open ditch or a pipe used to automatically stop, turn, or divide flowing water. The device is activated by a timing device that is either mechanical or electrical. The timing device is set to change the direction of the flowing water at a predetermined time.

Corrugations - A series of small, evenly spaced channels across a field. These channels are shallow and will carry a maximum streamflow of about 12 gallons per minute. Corrugations are generally used in close growing crops such as pasture, grain, and alfalfa.

Dikes - Embankments constructed of earth or other suitable materials to protect land against overflow or to regulate water.

Farmstead Windbreak - A strip or belt of shrubs established next to a farmstead or feedlot to reduce wind-speed and protect soil resources.

Fencing - Enclosing an environmentally sensitive area or water with fencing to control access of animals and people.

Field Border - A border or strip of permanent vegetation established at field edges to control soil erosion and slowly reduce or eliminate pollutants from entering an adjacent watercourse or water body.

Field Windbreak - A strip or belt of trees or shrubs, established in or adjacent to a field, to reduce wind-speed and protect soil resources.

Fish Stream Improvement - Improving a stream channel to make a new fish habitat or to enhance an existing habitat.

Furrows - A series of small channels having a continuous, nearly uniform slope in the direction of irrigation. A furrow is, as a rule, deep and wide enough to carry flows up to 50 gpm. Furrows are used in crops grown in rows such as corn, sugar beets, garden crop, etc.

Gated Pipe - A pipe with small rectangular slots, with adjustable gates, cut into the pipe at regular intervals. The intervals, as a rule, are wide enough to fit a field furrow spacing. The gated pipe is placed at the head of an irrigation set and is used to introduce small streams of water into individual furrows or corrugations.

Graded Borders or Borders - A form of controlled surface flooding. To employ this method, the field to be irrigated is divided into uniform strips by parallel dikes or border ridges. Each strip is irrigated independently. These strips have grade in the direction of irrigation but no cross slope. They are used to irrigate close growing crops and some row crops.

Hedgerow Planting - Establishing a living fence of shrubs or trees in, across, or around a field.

Irrigation Water Management - The art of timing and regulating irrigation water applications in a way that will satisfy the water requirement of the crop with minimum waste of water, soil, or plant nutrients.

Land Leveling or Land Grading - Modifying the surface relief of the field to a planned grade to provide a more suitable surface for efficiently applying irrigation water.

Level Borders - A level area enclosed by dikes that retain the water at a uniform depth until it has been taken into the soil. Water is introduced into the level borders at a rapid rate. They are used to irrigate close growing crops.

Lined Ditches - A fixed lining of impervious material installed in an existing or newly constructed irrigation ditch.

National Economic Development (NED) Alternative - An alternative that maximizes national economic benefits consistent with project objectives.

Palustrine - Refer: to vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the United States, as well as small, shallow, permanent or intermittent water bodies often called ponds. Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river flood plains; in isolated catchments; or on slopes.

Pasture and Hayland Planting - Establishing and reestablishing long-term stands of adapted species of perennial, biennial, or reseeding forage plants.

Pipelines - A means of conveying water from a water source to a farm or group of farms. They are also used to convey water between fields or to sprinkler laterals.

Pipe Risers - Vertical pipe with valve used to outlet water from an irrigation pipeline to the land or to other irrigation system components.

Ponds - Water impoundments made by constructing a dam or embankment or by excavating a pit or "dugout."

Proper Grazing Use - Grazing at an intensity that will maintain enough cover to protect the soil and maintain or improve the quantity or quality of desirable vegetation.

Range Seeding - Establishing adapted plants on rangeland to reduce soil and water loss and produce more forage.

Resource Protection (RP) Alternative - An alternative that achieves an acceptable level of protection of the resource of concern.

Sprinkler Irrigation - Application of water to the land surface by above ground sprinkler nozzles attached to either stationary, moving, or movable laterals.

Surface Irrigation - Application of water to the land surface through the use of corrugations, furrows, graded borders, or level borders.

Tail Water Recovery System - A means of collecting and reusing irrigation water that runs off a field. As a rule, when furrow or corrugation (graded surface) irrigation is used, excess water runs out of the end of the furrows. Excess water is collected with a ditch which delivers the water to a small pond. From the pond, the water can be pumped back to the head of the field where it can be reused.

Tree Planting - To establish or reinforce a stand of trees to conserve soil and moisture and help protect water leaving agricultural areas by "filtering" pollutants from the water flow.

Water Control Structure - A structure constructed of wood, metal, concrete, or other material such that, when placed in a stream channel, will dam, turn, or divide a streamflow.

Water Measuring Device - A structure that measures the quantity of water flowing.

Wildlife Upland Habitat

Management - Creating, maintaining, or enhancing areas including wetland, for food and cover and for upland wildlife.

Wildlife Watering Facility - Constructing, improving, or modifying watering places for wildlife.

Wildlife Wetland Habitat

Management - Retaining, creating, or managing wetland habitat for wildlife.

SPECIES LIST

Common name	Scientific name
	Plants
Alfalfa	<i>Medicago sativa</i>
Alkali bulrush	<i>Scirpus paludosus</i>
Antelope bitterbrush	<i>Purshia tridentata</i>
Big rabbitbrush	<i>Chrysothamnus</i> sp.
Big sagebrush	<i>Artemisia tridentata</i>
Black greasewood	<i>Sarcobatus vermiculatus</i>
Black sagebrush	<i>Artemisia novc</i>
Castle Valley clover saltbush	<i>Atriplex cuneata</i>
Cheatgrass	<i>Bromus tectorum</i>
Common blackbrush	<i>Coleogyne ramosissima</i>
Common cattail	<i>Typha latifolia</i>
Common oat	<i>Avena sativa</i>
Common winterfat	<i>Eurotia lanata</i>
Corn	<i>Zea mays</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
Engelmann spruce	<i>Picea engelmannii</i>
Ephedra	<i>Ephedra</i> sp.
Fourwing saltbush	<i>Atriplex canescens</i>
Fremont cottonwood	<i>Populus fremontii</i>
Galleta	<i>Hilaria jamesii</i>
Gambel oak	<i>Quercus gambelii</i>
Hardstem bulrush	<i>Scirpus acutus</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Jones cycladenia	<i>Cycladenia humilis</i> var. <i>Jonesii</i>
Maguire daisy	<i>Erigeron maguirei</i> var. <i>maguirei</i>
Mat saltbush	<i>Atriplex</i> sp.
Mountain mahogany	<i>Cercocarpus montanus</i>
Narrowleaf cottonwood	<i>Populus angustifolia</i>
Pinyon pine	<i>Pinus edulis</i>
Ponderosa pine	<i>Pinus ponderosa</i>
Quaking aspen	<i>Populus tremuloides</i>
Reed canary grass	<i>Phalaris arundinacea</i>
River birch	<i>Betula nigra</i>
Rocky mountain juniper	<i>Juniperus copulorum</i>
Russian olive	<i>Elaeagnus angustifolia</i>
Saltwort	<i>Glaux maritima</i>
Saltcedar tamarisk	<i>Tamarix pentandra</i>
San Rafael cactus	<i>Pediocactus despainii</i>
Sedge	<i>Carex</i> spp.

Common name

Serviceberry
Shadscale
Snowberry
Subalpine fir
Thurber fescue
Utah juniper
Western wheatgrass
White fir
Willow
Wire (Baltic) rush

Scientific name

Amelanchier sp.
Atriplex sp.
Symphoricarpos sp.
Abies lasiocarpa
Festuca thurberi
Juniperus osteosperma
Agropyron smithii
Abies concolor
Salix spp.
Juncus balticus

Fish

Bonytail chub
Brook trout
Brown trout
Channel catfish
Colorado squawfish
Cutthroat trout
Humpback chub
Rainbow trout
Razorback sucker
Roundtail chub

Gila elegans
Salvelinus fontinalis
Salmo trutta
Ictalurus punctatus
Ptychacheilus lucius
Cncorhynchus clarki
Gila cypha
Oncorhynchus mykiss
Xyrauchen texanus
Gila robusta

Herptofauna

Leopard frog
Pine (gopher) snake
Sagebrush lizard
Western rattlesnake
Western terrestrial garter snake
Western boreal toad

Rana pipiens
Pituophis melanoleucus
Sceloporus graciosus
Crotalus viridis
Thamnophis elegans
Bufo boreas

Birds

American kestrel
American robin
Bald eagle
Black-billed magpie
Blue-winged teal

Falco sparverius
Turdus migratorius
Haliaeetus leucocephalus
Pica pica
Anas discors

Common name

Brewer's blackbird
Brown-headed cowbird
California quail
Cinnamon teal
Common snipe
European starling
Gadwall
Golden eagle
Greater sandhill crane
Green-winged teal
Horned lark
Killdeer
Long-billed curlew
Long-eared owl
Mallard
Marsh wren
Mourning dove
Northern flicker
Northern harrier
Peregrine falcon
Red-winged blackbird
Ring-necked pheasant
Rough-legged hawk
Sage grouse
Sora
Tree swallow
Vesper sparrow
Western meadowlark
Western kingbird
Whooping crane
Wild turkey
Yellow-headed blackbird

Scientific name

Euphagus cyanocephalus
Molothrus ater
Callipepla californica
Anas cyanoptera
Gallinago gallinago
Sturnus vulgaris
Anas strepera
Aquila chrysaetos
Grus canadensis tabida
Anas crecca
Eremophila alpestris
Charadrius vociferus
Numenius americanus
Asio otus
Anas platyrhynchos
Cistothorus palustris
Zenaida macroura
Colaptes auratus
Circus cyaneus
Falco peregrinus
Agelaius phoeniceus
Phasianus colchicus
Buteo lagopus
Centrocercus urophasianus
Porzana carolina
Tachycineta bicolor
Poocetes gramineus
Sturnella neglecta
Tyrannus verticalis
Grus americana
Meleagris gallopavo
Xanthocephalus

Mammals

Beaver
Bighorn sheep
Black-footed ferret
Black-tailed jack rabbit
Chipmunk
Cottontail
Coyote
Deer mouse

Castor canadensis
Ovis canadensis
Mustela nigripes
Lepus californicus
Tamias spp.
Sylvilagus spp.
Canis latrans
Peromyscus maniculatus

Common name

Elk
Golden-mantled ground squirrel
House mouse
Long-tailed weasel
Man
Meadow vole
Mink
Montane vole
Moose
Mountain lion
Mule deer
Muskrat
Pronghorn
Raccoon
Red fox
Rock squirrel
Striped skunk
Western harvest mouse
White-tailed jackrabbit
White-tailed prairie dog

Scientific name

Cervus elaphus
Spermophilus lateralis
Mus musculus
Mustela frenata
Homo sapiens
Microtus pennsylvanicus
Mustela vison
Microtus montanus
Alces alces
Felis concolor
Odocoileus hemionus
Ondatra zibethicus
Antilocapra americana
Procyon lotor
Vulpes vulpes
Spermophilus variegatus
Mephitis mephitis
Reithrodontomys megalotis
Lepus callotis
Cynomys leucurus

ATTACHMENT III

Biological Assessment
Supplemental Biological Assessment
Fish and Wildlife Coordination Act Report
Biological Opinion



United States Department of the Interior

FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
2080 ADMINISTRATION BUILDING
1746 WEST 1700 SOUTH
SALT LAKE CITY, UTAH 84104-6110

August 26, 1987

TAKING
PRESERVE
AMERICA

IN REPLY REFER TO:

To: Regional Director, Upper Colorado Region,
Bureau of Reclamation, Salt Lake City, Utah

From: State Supervisor, Fish and Wildlife Enhancement
Fish and Wildlife Service, Salt Lake City, Utah

Subject: Section 7 Consultation and Fish and Wildlife Coordination Act
Compliance for Bureau of Reclamation and Soil Conservation Service
for the Price - San Rafael Rivers Unit - Colorado River Water
Quality Improvement Program

The U.S. Fish and Wildlife Service (Service) has reviewed your July 13, 1987 memorandum requesting an updated species list for the subject project. It appears that listed endangered and threatened species may occur in the area of influence of this the action. Therefore, we are furnishing the following list of species:

- | | | |
|---------------------|--|---|
| Black-footed ferret | (<u>Mustela nigripes</u>) | E |
| Colorado squawfish | (<u>Ptychocheilus lucius</u>) | E |
| Bonytail chub | (<u>Gila elegans</u>) | E |
| Humpback chub | (<u>Gila cypha</u>) | E |
| Maguire daisy | (<u>Erigeron maguirei</u> var <u>maguirei</u>) | E |
| Jones cycladenia | (<u>Cycladenia humilis</u> var <u>jonesii</u>) | T |
| San Rafael cactus | (<u>Pediocactus despainii</u>) proposed | E |

We have sent you this new list because it appears there will be a difference between this proposal and the previous one. For example, in the earlier study it was concluded that its completion would affect 530 acres of wetlands and 230 acres of riparian vegetation, whereas, now 15,000 acres of wetlands would be affected under the new proposal. Also in the previous study the Soil Conservation Service was to advise the Bureau of Land Management on measures to reduce salt accretion from public lands. The plants are found on public lands near the San Rafael River that may be affected by these measures. Reclamation's previous biological assessment only considered the Colorado squawfish.

The Bureau of Reclamation should review their proposed action and determine if the action would affect any listed species. If the determination is "may effect" for listed species you must request in writing formal consultation from the Field Supervisor, U.S. Fish and Wildlife Service at the address given above. At that time you should provide this office a copy of the biological assessment and any other relevant information that assisted you in reaching your conclusion. In addition, if you determine that the action is likely to jeopardize the continued existence of proposed species, you must confer with the Service.

Your attention is also directed to Section 7(d) of the Endangered Species Act, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species.

The Service representative who will provide you technical assistance is Jim Coyner, FTS 588-5630, commercial 524-5630.

Robert A. Ruesink

Endangered and Threatened Species

Biological Assessment
for
Price-San Rafael Rivers Unit
Utah

Colorado River Water Quality
Improvement Program

April 1988

Upper Colorado Region
Bureau of Reclamation
Department of the Interior

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A. Introduction

This assessment identifies and evaluates the potential impacts the Price-San Rafael Rivers Unit of the Colorado River Water Quality Improvement Program may have on threatened and endangered wildlife, fish, and plants identified by the U.S. Fish and Wildlife Service in an August 26, 1987, memorandum concerning compliance with Section 7 of the Endangered Species Act of 1973 (Public Law 93-205) and its subsequent amendments.

B. Project Description

1. Background

The Price-San Rafael Rivers Unit would be implemented as a joint effort between the Bureau of Reclamation (Reclamation) and the Soil Conservation Service (SCS) under the Colorado River Basin Salinity Control Act (Public Law 93-320) and Public Law 96-375. The latter law specifically authorizes the Secretary of the Interior to prepare a feasibility report on this unit.

Reclamation and the SCS jointly prepared a report in March 1986 for consideration by the Colorado River Basin Salinity Control Forum (Forum). The report summarized an appraisal-level investigation of gravity sprinkler irrigation systems for the Ferron and Cottonwood Creek areas. Under the plan, all off-farm conveyance facilities (pressurized pipelines) would be constructed as a Reclamation project. All on-farm improvements would be constructed as an SCS project and would require cost sharing by local

beneficiaries. The Forum has instructed both agencies to proceed with additional investigations toward a combined plan.

2. Preferred Alternative

Eight alternative plans for salinity reduction in the study area have been evaluated by Reclamation; however, the only alternative that met project objectives and Reclamation's tests of planning viability was the Irrigation Systems Improvement alternative. This plan consists of three major components: 1) developing a pressurized sprinkler irrigation system jointly with the SCS to improve 26,600 acres of farmland, 2) improving winter water delivery practices by providing culinary water at subsidized rates for livestock use, lining stock ponds, making improvements on the Cottonwood Creek livestock watering system, construction of a pipeline to a water treatment plant, and 3) treating 10,000 acres of farmland with surface improvements such as land leveling and gated irrigation pipe. The sprinkler irrigation system would be developed by Reclamation and the SCS, the winter water replacements would be implemented by Reclamation, and surface irrigation improvements would be implemented by the SCS.

Under the preferred plan, salt loading to the Colorado River system would be reduced by about 135,000 tons per year. The preferred plan meets the criteria of the Principles and Guidelines for Water and Related Land Resources since the four tests for completeness, acceptability, efficiency, and effectiveness are satisfied.

The plan would involve installing a total of 370 miles of pressurized pipeline

for the sprinkler irrigation system; 83 miles would be installed by Reclamation in lieu of existing off-farm laterals and 287 miles would be installed on-farm by the SCS with cost sharing by the individual farmers. Reclamation would provide 178 culinary service connections for winter livestock water, would line 83 existing stock ponds, and install 10.6 miles of pipe that would both improve the Cottonwood Creek livestock water system and deliver raw water to the Orangeville and Castledale water treatment plants.

A total of 110 miles of open, unlined laterals would be abandoned as a result of the preferred plan. Additionally, the 10-mile-long Clipper Canal in the Cottonwood Creek area would be abandoned. Approximately 200 acres of upland cover type would be temporarily disturbed as a result of burying 83 miles of pipe. These areas would be reseeded after construction. On-farm laterals and ditches would be replaced with 287 miles of pipe creating a temporary vegetation disturbance on farmland that would be reseeded to crops by the local landowners.

Abandonment of the Clipper Canal and off-farm laterals would cause an additional 204 acres of riparian and wetland habitats to become more xeric, returning eventually to desert shrub, the predominant natural cover type in the area.

On-farm improvements on 26,600 acres of sprinkler irrigated land and 10,000 acres of surface improved farmland would reduce on-farm fence rows and ditch-bank habitat significantly. In addition, off-farm riparian and wetland habitat supported by irrigation (surface runoff and deep percolation) would be reduced in quality and quantity. These lands would also become more xeric in

5
nature, returning to a desert shrub cover type.

Wetland cover types supported by stock ponds would also be eliminated. It is estimated that about 10 acres of salt grass, rush, sedges, and willow would be eliminated as a result of lining 83 stock ponds.

C. Species Evaluation

1. Black-footed ferret (Mustela nigrapes)

The historical range of the endangered black-footed ferret includes portions of Carbon and Emery Counties, Utah (Snow, 1972). A survey of potential habitat in the general region was made in 1977 by the Utah Division of Wildlife Resources for the Bureau of Land Management. No direct observations or substantiated sign of the animals were located (Boner, et al., 1977).

Black-footed ferrets are more closely associated with prairie dog colonies than any other habitat type. The white-tailed prairie dog (Cynomys leucurus) is endemic to the project area. However, agricultural practices have largely eliminated the colonies and the species is seen either singly or in small scattered "towns" in native upland habitat.

There have been no confirmed sightings in Carbon or Emery Counties in the recent past. The last confirmed sighting of the black-footed ferret in Utah was an animal killed 2 miles south of Blanding, Utah, in San Juan County prior to 1952 (Jobman and Anderson, 1981).

There have been "probable sightings" in Emery County from 1970 to 1981. The term "probable sightings" was defined as a sighting considered one which was not made by a competent and dependable observer, but the details of the sighting report appear to identify the animal as a black-footed ferret. One sighting, made August 1980, was within the immediate project area; i.e., between the towns of Clawson and Ferron, Utah (Jobman and Anderson, 1981).

While it is possible that a black-footed ferret population may exist within the project area, the proposed action would not adversely effect either the animals or their habitat. Buried pipelines would cause a temporary disturbance to white-tailed prairie dog habitat during construction; however, there is enough latitude to move the pipeline alignments to miss any prairie dog colonies that may exist. The loss of riparian and wetland habitat would not adversely affect this upland species.

2. Colorado Squawfish

The Green River between its confluence with the Price River and its confluence with the San Rafael River is a high concentration area for adult Colorado squawfish. In addition, this reach is a high concentration area for juvenile squawfish as well as a suspected spawning area. The Green River and its tributaries constitute the highest priority site for maintenance and recovery of the Colorado squawfish (U.S. Fish and Wildlife Service, 1988).

Less is known about specific use of the Price and San Rafael Rivers by squawfish. Only one squawfish has been collected in the San Rafael River some 3 miles above its confluence with the Green (Boner, 1977). No squawfish have

been collected in the Price River. Squawfish have been captured in the confluence area of the San Rafael where high, warm tributary flows possibly provide some attractant for the native fishes residing in the colder Green River.

3. Bonytail Chub

Bonytail chub are very rare throughout the Colorado River Basin. Confounding the determination of distribution of the species is the difficulty identifying and separating bonytail from other Gila species in the upper basin. Holden captured two bonytail on the Green River above the project area in Desolation Canyon in 1974 and one near Jensen, Utah, in 1978 (Holden, 1978). The U.S. Fish and Wildlife Service captured several fish resembling bonytail chub from Gray Canyon of the Green River in 1980 and 1981 (Tyus, et al., 1982), however, only one was tentatively identified as a bonytail.

No bonytail have been collected in or near the Price-San Rafael Rivers or their confluence with the Green River.

4. Humpback Chub

Humpback chub can be found in isolated areas of the Green, Yampa, Little Colorado, and Colorado Rivers. Desolation and Gray Canyons above the confluence of the Price River and Labyrinth Canyon just below the confluence of the San Rafael contain the closest known humpback chub populations to the project area (U.S. Fish and Wildlife Service, 1988). In addition, young-of-the-year and larval Gila have been collected in backwaters in various

locations throughout the lower Green River.

5. Maquire Daisy (Erigeron maquirei var. maquirei)

The endangered maquire daisy is one of the rarest plant taxa in the United States (Department of the Interior, 1985). The species is only known from a restricted area in Emery County, Utah, on the Navajo sandstone formation (Welsh and Chatterly, 1985). It was originally collected by Dr. Bassett Maquire in 1940 and appears to have become extirpated at its two historical sites (Department of the Interior, 1984). The species is known to exist within a desert shrub community on BLM administered lands and in 1985 only five plants were known to exist (Department of the Interior, 1985); the species was officially listed as Endangered on September 5, 1985.

It is extremely unlikely that this species would exist in the predominantly Mancos shale formation within the project area.

6. Jones Cycladenia (Cycladenia humillis var. jonesii)

This species exists in Emery, Grand, and Garfield counties in five known populations (Welsh and Chatterly, 1985). However, several more populations were located by personnel working for the National Park Service in 1985, more than doubling the previously known populations (Department of the Interior, 1986b). Because of the increased numbers, the U.S. Fish and Wildlife Service listed the species as Threatened on May 2, 1986. The closest known population of this species to the project area exists in the San Rafael Swells area of Emery County on BLM lands. The species grows on Cutler, Summerville, and

Chinie formations in salt desert shrub, ephedra-buckwheat, blackbush, and scattered juniper communities.

This species, like the Maquire daisy, is highly unlikely to exist within the project area.

7. San Rafael Cactus (Pediocactus despainii)

The San Rafael Cactus was listed as an endangered species on September 16, 1987 (Department of the Interior, 1987). This small cactus was first discovered in 1978 in the San Rafael Swell area in eastern Emery County (Department of the Interior, 1986a). The habitat for this species is open areas of pinyon-juniper on the exposed Carmel Limestone Formation (Welsh and Chatterly, 1985). Only two populations of 2,000 to 3,000 plants are known to exist on BLM and State of Utah lands at elevations of 6,000 to 6,200 feet above sea level.

This species is highly unlikely to exist within the project area of western Emery and Carbon Counties.

D. Conclusion

The Price-San Rafael Rivers Unit would not adversely affect the habitat of the black-footed ferret. Existing agricultural practices have largely eliminated white-tailed prairie dog colonies on farm lands. These colonies would be considered primary habitat for the ferret. Uplands adjacent to the farmlands would receive surface disturbance on about 200 acres during pipeline

construction. Care would be taken not to affect any colonies with a pipeline alignment if any exist in the area. While on occasion, prairie dog burrows may be affected by construction, it would only be a temporary disturbance with no potential harm to black-footed ferrets, if they exist in the area.

Since none of the endangered fish species are found within the Price-San Rafael project area, impact to their habitat or numbers would have to result from changes in water use within the project. The U.S. Fish and Wildlife Service has determined that any depletion of water in the Green River basin would indirectly contribute to the eventual loss of the endangered fishes.

To resolve the controversy between water development and the protection of endangered fishes, a recovery implementation plan was developed. This plan provides for water development interests to contribute to the recovery of the species while allowing them to continue water development. In order to avoid jeopardy and provide for the recovery of the endangered fishes, development interests must pay the U.S. Fish and Wildlife Service \$10 per acre-foot of water that they consumptively use. Because of Reclamation's participation and funding in the Recovery Implementation Plan, they are exempt from depletion charges.

The SCS, however, is not exempt and must therefore, provide FWS with \$10 per acre-foot for the average annual depletion caused by on-farm improvements. The SCS has estimated that some 19,350 acre-feet of water will be lost annually to the Green River system as a result of the project. SCS has agreed to require such funding from project recipients.

The three listed plants all exist southeast of the project area in dry desert shrub country. Their habitat is in jeopardy from coal, gas, and oil leases, collecting, cattle grazing, and off-road vehicle use. While no impacts can be envisioned to these species or their habitat, Reclamation would conduct an endangered plant survey on buried pipeline alignments prior to any construction on off-farm habitat.

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Endangered and Threatened Species

Supplemental Biological Assessment

for

Price - San Rafael Rivers Unit

Utah

Colorado River Water Quality

Improvement Program

and

Colorado River Salinity Control Program

July 1993

Soil Conservation Service

United States Department of Agriculture

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BIOLOGICAL ASSESSMENT SUPPLEMENT
PRICE - SAN RAFAEL RIVER BASIN
COLORADO RIVER SALINITY CONTROL PROGRAM

2

A. INTRODUCTION

This supplement identifies and evaluates the potential impacts the Price - San Rafael Rivers Unit of the Colorado River Water Quality Improvement Program may have on threatened and endangered wildlife, fish and plants identified by the U.S. Fish and Wildlife Service (USFWS) in a letter dated March 22, 1993. The original USFWS memorandum (August 26, 1987) concerning compliance with Section 7 of the Endangered Species Act of 1973 (Public Law 93-205) and its subsequent amendments, was addressed in a Biological Assessment dated April 1988. Subsequent consultations with the USFWS over the Roundtail Chub (Category 2 species), and other recently listed and candidate species lead to the March letter requesting an updated biological assessment on the previously listed species and species listed since the 1988. consultation. In discussions with the Bureau of Reclamation (Reclamation) it was decided to include the endangered plant, "the lady's tresses, in this assessment.

B. PROJECT DESCRIPTION

This section has not changed since the April 1988 Biological Assessment.

C. ENDANGERED AND THREATENED SPECIES - EVALUATION

1. Peregrine falcon (Falco peregrinus)

This species was addressed in discussions with the USFWS subsequent to the 1988 Biological Assessment for Price - San Rafael Rivers Unit, Utah, and was included in the USFWS Biological Opinion of February 4, 1992. The conclusion of no expected effect has not changed.

2. Bald eagle (Haliaeetus leucocephalus)

a. Life History:

The Bald eagle inhabits the North American continent from the Gulf of Mexico to the Arctic. It is usually found near the seacoast, inland lakes, and rivers [USFWS Bald Eagle Recovery Plan (Southwestern Population) 1982]. However in portions of the intermountain region, Bald eagles winter commonly in semiarid valleys. Though the bird will take and eat what is in plentiful supply, fish, waterbirds and small

mammals are the most common prey. Carrion is also utilized, particularly during the winter period (US Forest Service (USFS) and other federal and state agencies, Ogden, Utah 1980). The Bald eagle prefers to build large, heavy nests 10 - 150 feet above ground in very tall living trees, usually close to water. It shows strong attachment to the nest site, and characteristically adds new material to the nest each year [Forest and Rangeland Birds of the United States (FRBUS 1991)]. The area required for a breeding pair is approximately 640 acres (1 square mile) (USFWS, Northern States Bald Eagle Recovery Plan, July 1983).

b. Location in Project Area:

There is a nest located in a live cottonwood tree in the irrigated area near Castle Dale, Utah. The tree is growing in a group of trees in an irrigated alfalfa field. The tree is growing on a slight slope near the lower end of the field. Normal farming activity has occurred around the base of the tree. This is the third year the eagles have occupied the tree and second year nesting has occurred. Several irrigated fields occur within 1 mile of the nest. The farm fields are either flood or sprinkler irrigated. On land it owns, Utah Power and Light (UP&L) use sprinkler irrigation on 20+ acres of alfalfa located within 3/4 of a mile of the tree. All the alfalfa or pasture fields are hayed and/or grazed on a regular basis.

State highway 10 is a heavily traveled road within 1/2 mile of the tree and the UP&L power plant is within 1 mile of the tree.

c. Impacts:

The potential impacts of the project to the nest tree (if the landowner chooses to participate) have been evaluated. No construction activities will take place within a one half mile radius from approximately February 15 to July 15, when eagles are present. The tree's water supply will not be affected; the field will continue to be irrigated with or without the project. Application of irrigation water would change from flood to sprinkler with the project. A buried pipeline with risers and a side roll sprinkler is the most likely equipment to be installed. Several fields within 1 mile of the tree already have these systems installed.

d. Conclusion:

No significant change in the farming activity will occur. Construction will be avoided within a 1/2 mile radius of the tree during February 15 to July 15 each year (when the eagles are present). The project will have no effect on the tree and will not disturb the breeding/nesting of the Bald eagles.

3. Humpback chub (*Gila cypha*)

This species was addressed in the Biological Assessment for Price - San Rafael Rivers Unit, Utah, April 1988 and the Biological Opinion of February 4, 1992. The estimated average annual depletion of the Colorado River system has not changed. Conservation measures for the Endangered fish, (USFWS Biological Opinion, February 4 1992) will be followed.

4. Maytail chub (*Gila elegans*)

This species was addressed in the Biological Assessment for Price - San Rafael Rivers Unit, Utah, April 1988 and the Biological Opinion of February 4, 1992. The estimated average annual depletion of the Colorado River system has not changed. Conservation measures for the Endangered fish, (USFWS Biological Opinion, February 4, 1992) will be followed.

5. Colorado squawfish (*Ptychocheilus lucius*)

This species was addressed in the Biological Assessment for Price - San Rafael Rivers Unit, Utah, April 1988 and the Biological Opinion of February 4, 1992. The estimated average annual depletion of the Colorado River system has not changed. Conservation measures for the Endangered fish, (Biological Opinion, February 4, 1992) will be followed.

6. Razorback sucker (*Xyrauchen texanus*)

This species has been listed since the 1998 Biological Assessment. Consultation was done by Reclamation and it was included in the USFWS Biological Opinion, February 4, 1992. The estimated average annual depletion of the Colorado River system has not changed. Conservation measures for the Endangered fish, (Biological Opinion, February 4, 1992) will be followed.

7. Black-footed ferret (*Mustela nigripes*)

This species was addressed in the Biological Assessment for Price - San Rafael Rivers Unit, Utah, April 1988 and the Biological Opinion of February 4, 1992. The conclusion of no expected effect has not changed.

8. Jones cyciadenia (*Cycladenia humilis* v *jonesii*)

This species was addressed in the Biological Assessment for Price - San Rafael Rivers Unit, Utah, April 1988 and the Biological Opinion of February 4, 1992. The conclusion of no expected effect has not changed.

9. Maguire daisy (*Erigeron maguirei* v. *maguirei*)

This species was addressed in the Biological Assessment for Price - San Rafael Rivers Unit, Utah, April 1988 and the Biological Opinion of February 4, 1992. The conclusion of no expected effect has not changed.

10. San Rafael cactus (*Pediocactus despainii*)

This species was addressed in the Biological Assessment for Price - San Rafael Rivers Unit, Utah, April 1988 and the Biological Opinion of February 4, 1992. The conclusion of no expected effect has not changed.

11. Heliotrope milkvetch (*Astragalus montii*)

This species occurs in Sanpete and Sevier Counties on the National Forest in Alpine areas in mixed grass - forb communities on windblown ridges and snowdrift sites between 10,500 - 11,000 feet elevation (Utah Endangered, Threatened, and Sensitive Plant Field Guide (UTESPFG 1991)). This is outside the project area which is limited to the irrigated areas of Carbon and Emery Counties. It is highly unlikely this species exists in the project area.

12. Ute lady's tresses (*Spiranthes diluvialis*)

The Ute's lady's tresses was listed as a threatened species on January 17, 1992. It's distribution in Utah is limited to Uintah, Garfield, Daggett, Wayne and Duchesne Counties. There is no record of Ute lady's tresses occurring in Carbon or Emery Counties (USFWS 1993).

The Ute lady's tresses occurs primarily along streams, bogs and open seepage areas in cottonwood, tamarix, willow and pinyon - juniper communities at 4,400 to 6,810 feet in elevation (UTESPFG 1991). Most of the irrigation pipeline construction to replace laterals by Reclamation will be done

in uplands. SCS activities are in agricultural areas (including irrigation induced wetlands). These areas are routinely disturbed by farming/grazing activities. It is unlikely that it occurs in the project area.

D. CANDIDATE SPECIES

1. Northern goshawk (Accipiter gentilis)

This species occurs in dense forest in montane ecosystems. It is listed as an uncommon winter resident in the San Rafael Desert. It feeds on a wide variety of birds, mammals and insects [Fauna of Southeastern Utah and Life Requisites Regarding Their Ecosystems (FSULRRE 1990)]. This type of prey base will not be affected by the project. It is highly unlikely that the project will affect this species.

2. Ferruginous hawk (Buteo regalis)

This species does inhabit the project area. It feeds on a variety of birds, mammals and reptiles (FSULRRE 1990). In the adjoining Uinta Basin Unit of the Colorado River Water Quality Improvement Program, SCS has been using the Habitat Evaluation Procedure (HEP - USFWS) to monitor for Ferruginous hawk habitat in pasture, cropland, rangeland, riparian and emergent wetland cover types since 1984. The salinity program in the Uinta Basin, located in northeastern Utah, was started in 1980 and is approaching 50% complete. The 1992 Colorado River Salinity Control Program Monitoring and Evaluation Report for the Uinta Basin Unit shows no significant change in habitat suitability for the hawk. The Uinta Basin habitat is essentially the same as the Price - San Rafael Unit; therefore it is unlikely that project implementation will affect this species.

3. Black tern (Chlidonias niger)

This species occurs within the project area (FSULRRE 1990). Special habitat requirements are aquatic habitat with extensive stands of emergent vegetation and large areas of open water. It prefers nests of emergent vegetation over water up to 3 feet deep or near open water (FRBUS 1991). The majority of impacted herbaceous emergent wetlands (4,040 ac. out of total 4,430 ac.) occur within farm fields, not adjacent to open water. The fields are irrigated and used for cropping, pasture and/or hayland. The vegetation on these fields will change with the project, generally from grasses to alfalfa. However the land use will not, nor will the amount of human/livestock disturbance change significantly. It is unlikely that this species will be affected.

4. Western Least Bittern (Ixobrychus exilis hesperis)

This species is an uncommon transient in the San Rafael Desert (FSULRRE 1990). Special habitat requirements are freshwater wetlands surrounded by tall aquatic vegetation. It feeds on the open water side of emergents, and captures small fish. Also takes frogs, tadpoles, salamanders, leeches, mollusks, crustaceans, insects, lizards, slugs, and occasionally small mammals (FRBUS 1991). The larger marshes such as Desert Lake will not be significantly impacted by the project. It is unlikely that this species will be effected.

5. Loggerhead shrike (Lanius ludovicianus)

The Loggerhead shrike was mentioned as a species of concern, primarily because of concern for the prey base. The shrike is a yearlong common resident in all of southeastern Utah, inhabiting desert and submontane habitats. The shrike is not listed as using any wetland ecosystem, but agriculture, sagebrush/grass, saltbush/grass and black brush ecosystems are critical (FSULRRE 1990). Agriculture will continue and other habitats mentioned will not be affected. The primary prey (83%) for the shrike in the west is a variety of insects (mostly grasshoppers and crickets), but it also eats small mammals, birds and reptiles (FRBUS 1991). The prey base will not be significantly impacted. It is unlikely that this species will be effected.

6. White-faced ibis (Plegadis chihi)

The White-faced ibis is a rare summer resident of the San Rafael desert and is a rare transient or summer resident in the rest of southeastern Utah (FSULRRE 1990). It is a colonial nester with or near colonies of great blue, and black-crowned night-herons, or snowy egrets. It generally nests in large beds of bulrushes or reeds several feet above the water, infrequently on dry land. It feeds by probing freshwater marshes. The ibis consumes insects, newts, leeches, worms, mollusks, crustaceans, frogs, fishes and some snails. After nesting season, it feeds in larger marshes as well as irrigated fields (FRBUS 1991). The larger marshes such as Desert Lake will not be significantly impacted by the project. Irrigated fields will continue to be available for feeding. It is unlikely that the project will affect this species.

7. Heliotrope pika (Ochotona princeps moorei)

This species inhabits talus slopes and rockslides at montane elevations. They cannot tolerate air temperatures above 82 degrees F. It is highly unlikely this species exists in the project area.

8. Roundtail chub (Gila robusta)

This species is addressed in Attachment VIII, of the Price - San Rafael, Draft Environmental Impact Statement (PSRDEIS), August 1991 "Evaluation of Alternative Plans on the Roundtail chub (Gila robusta)". The conclusion was no negative effect on this species and was concurred in by USFWS letter of March 22, 1993.

9. Flannelmouth sucker (Catostomus latipinnis)

In the Cold Desert Ecological Association this non-game fish is common in Cottonwood Creek, and the San Rafael, Colorado and Green Rivers. There is limited occurrence in Ferron and Huntington Creeks and uncommon in the Price River and Scofield tributaries. This species can tolerate highly turbid conditions. It feeds on aquatic vegetation and zooplankton. Sucker spawning occurs in riffle areas from April to May when water temperatures reach 43-50 degrees F. Adults can be found at depths of 1 - 20 feet in sparsely vegetated pools of large streams. Construction of dams can prove to have negative effects on populations as cold water releases prevent spawning downstream (FSULRRE 1990).

All effects from the project occur downstream from existing dams. As shown in the average annual stream hydrographs for the Roundtail chub [Attachment VIII, PSRDEIS, August 1991 "Evaluation of Alternative Plans on the Roundtail chub (Gila robusta)"]. There is generally very little change to the average annual hydrographs in April and May. In addition, stream flows are highly variable from year to year. In drought years the project does not have a significant effect on stream flow. It is unlikely that the project will significantly affect this species.

10. Creutzfeldt cats-eye (Cryptantha creutzfeldtii)

This species is known to occur on private land and is found in Shadscale and Mat atriplex communities on Mancos Shale formation (UTETSPFG 1991). The majority of work on this project will be confined to irrigated and previously disturbed areas. If construction of a pipeline were to take place in previously undisturbed areas then a reconnaissance of the pipeline construction zone will be done. If the plants are found the pipeline can be relocated.

11. Smith wild buckwheat (Eriogonum smithii)

This species is not known to occur on private land and is found in Purple - sage, matchweed, ephedra - Indian ricegrass, and rabbitbrush communities on the Entrada Formation and on stabilized dunes at 5,200 to 5,610 feet elevation (UTETSPFG 1991). The Entrada Formation occurs well below the project area. It is highly unlikely this species exists in the project area.

12. Canyon sweetvetch (Hedysarum occidentale v. canone)

This species is known to occur on private land and is found in Pinyon-juniper, sagebrush, and wash communities between 5,000 and 8,000 feet elevation (UTETSPFG 1991). The area treated by the project will be irrigation supply systems adjacent to or inside irrigated areas and irrigated fields. Existing Pinyon-juniper and sage sites and washes associated with these sites will not be affected. It is unlikely that this species would be affected.

13. Low hymenoxys (Hymenoxys depressa)

This species is not known to occur on private land and is found in Ephedra, Sagebrush, Shadscale and pinyon-juniper communities between 4400 to 7120 feet (UTETSPFG 1991). It is highly unlikely this species exists in the project area.

14. Jones psorothamnus (Psorothamnus polyadenius v. jonesii)

This species is found on BLM land in Emery and Wayne Counties in salt desert shrub communities on Mancos Shale Formation (Blue Gate and Tununk members and less commonly elsewhere at approximately 4,820 feet elevation (UTETSPFG 1991). The USGS geologic maps shows that the Blue Gate and Tununk Formation (member of the Mancos Shale Formation outcrop) areas are relatively steep hills. Generally the irrigated areas do not occur on these rock units. It is unlikely that this species occur in the project area.

15. Thompson's pink flame-flower (Talinum thompsonii)

This species is not known to occur on private land. It is found on silicious conglomeratic gravels in pinyon - juniper and ponderosa pine communities at about 7,500 feet elevation (UTETSPFG 1991). It is unlikely that these occur in the project area.

E. CONCLUSION

No additional impacts to listed species have been identified as a result of this supplemental Biological Assessment. The impacts to the Endangered Fish were noted in the Biological Assessment (April 1988), subsequent consultations, and the Biological Opinion (February 4, 1992).

The Bald eagle nesting site has been evaluated. The nesting tree will not be disturbed by the project. No effect on the Bald Eagle is expected.

The two listed endangered plant species not addressed in previous consultation are the Heliotrope milkvetch (Astragalus montii) and the Ute lady's tresses (Spiranthes diluvialis). Neither species is known to occur in the project area of Carbon and Emery counties.

The Heliotrope milkvetch occurs in the Alpine zone (10,500 - 11,000 feet) (UTETSPFG 1991), the project occurs in primarily semi-desert zone (<7000 feet). It is highly unlikely this species exists in the project area therefore the project will have no effect.

Suitable habitat for the Ute lady's tresses may exist in the project area, although no records indicate its occurrence within the project area. Reclamation will initiate a survey for the species in conjunction with the USFWS, to insure it does not occur. Consultation will be initiated should it be found.

Candidate species listed in the March letter were evaluated and no effect on any of the species is anticipated.

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United States Department of the Interior

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In Reply Refer To

(FWE)

February 7, 1992

6-UT-84-F-0030

Memorandum

TO: Regional Director, Bureau of Reclamation, Upper Colorado Regional Office, Salt Lake City, Utah

FROM: Assistant Field Supervisor, U.S. Fish and Wildlife Enhancement, Salt Lake City, Utah

SUBJECT: Fish and Wildlife Coordination Act/Biological Opinion for the Price-San Rafael Salinity Control Project.

Enclosed is a final Coordination Act Report for the subject project and a appended Biological Opinion.

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PRICE-SAN RAFAEL SALINITY CONTROL UNIT
COLORADO RIVER WATER QUALITY
IMPROVEMENT PROGRAM

A FISH AND WILDLIFE COORDINATION ACT REPORT
SUBMITTED TO
THE UPPER COLORADO REGION
BUREAU OF RECLAMATION

PREPARED BY
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
UTAH/COLORADO FIELD OFFICE
SALT LAKE CITY, UTAH

JANUARY, 1992

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INTRODUCTION

The purpose of this report is to provide an analysis of fish and wildlife impacts which would occur as a result of the authorization, construction, and operation of the Price-San Rafael Salinity Control Unit, Colorado River Water Quality Improvement Program. Recommendations to mitigate or offset adverse impacts are made in compliance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and in cooperation with the Utah Division of Wildlife Resources.

Impacts to listed threatened or endangered species are discussed in a biological opinion required pursuant to Section 7 of the Endangered Species Act (attached). The biological opinion along with the Coordination Act Report represent the Services assessment of project impacts to fish and wildlife in the area.

Findings and Recommended actions outlined in the above reports will be used by Reclamation in preparing NEPA compliance documents and to accompany Reclamation planning reports during project authorization.

The Service's goal in analyzing project impacts was to mitigate losses "in place" and "in kind" in keeping with Service mitigation policy. Further, we have tried to ensure that "no net loss" of wetlands would occur. SCS voluntary replacement of wildlife values foregone does not ensure that all losses will be compensated or that replacement values will be of the same quantity and quality.

DESCRIPTION OF STUDY AREA

DESCRIPTION OF THE PROJECT

An irrigation systems improvement plan is proposed for the Price-San Rafael River Unit of the Colorado River Water Quality Improvement Program. In the proposal under consideration the Department of the Interior (Bureau of Reclamation), the Department of Agriculture (Soil Conservation Service and Agricultural Stabilization and Conservation Service), and landowners would voluntarily cooperate in completing project work.

The irrigation systems improvement plan under consideration consists of two parts: (1) developing a pressurized sprinkler irrigation system and, (2) improving winter water practices by providing culinary water at subsidized rates, lining stock ponds, making improvements to the existing Cottonwood Creek livestock watering systems, and constructing a pipeline to deliver raw water to the Orangeville and Castledale water treatment plants. The project area includes approximately 65,650 acres of land capable of being irrigated; however, the project proposes to treat only 36,050 acres under sprinkler or surface irrigation.

The plan would install a total of 370 miles of pipeline for the sprinkler system, of which 83 miles of 8 to 33-inch pipe would be installed by Reclamation off-farm and 287 miles of 4 to 15-inch pipe would be installed on-farm by the Soil Conservation Service. Approximately 110 miles of off-farm laterals and 6.8 miles of the Clipper Ditch would be abandoned as a result of the pressurized system.

Implementation of the sprinkler irrigation plan would be on a voluntary, farm-by-farm basis since each farmer would be required to provide cost sharing for their own on-farm improvements. A majority of farmers served by a given off-farm lateral would need to participate before off-farm construction of a pressurized (buried) pipeline would begin.

Improved Winter Livestock Water Systems

The preferred plan would involve improving winter livestock water systems within the service areas of Carbon Canal Company and the Huntington-Cleveland Irrigation Company. These two entities must presently operate their canals during the wintertime to supply water to shareholders needing it for their livestock to drink. Implementation of the winter water system improvements would allow winter operation of the associated canals to be discontinued, resulting in the elimination of winter seepage losses from them.

Stockpond Lining

This plan would involve improving 70 and 13 stockwater ponds in the Price and San Rafael River Basins, respectively. These ponds are located outside culinary service areas. Each pond would be enlarged to an average capacity of

0.86 acre-feet (280,500 gallons), providing storage capacity equal to two times the projected average winter livestock consumption. To facilitate owner-installation, the ponds would be lined with a Hypalon (or equivalent) lining material which would be custom prefabricated and would not require earth cover. Fencing would be constructed to prevent damage and contamination by livestock, and a remote outlet would be provided. The ponds would be filled in October or early November, after which the canals would be shut off.

Culinary Water Deliveries

The Carbon and Huntington-Cleveland areas both have existing piped culinary water systems which cover the majority of the areas where livestock are located. However, because there are some unserved areas and because culinary water is much more expensive than canal water, the canal systems are still operated during the winter in these areas. This plan would provide new metered livestock turnouts for all stockwater users, and provide a rate subsidy to all stockwater users during the winter months to encourage use of culinary water. The subsidy would not be in effect during the summer growing season; therefore, the existing stock ponds would be utilized as they have been previously.

An estimated total of 178 culinary connections for winter livestock would be required. The Price River Basin would require 140, and 38 would be required in the San Rafael River Basin.

New Cottonwood Creek Delivery System

In the Cottonwood Creek area a new 10.6-mile pipeline would be constructed to deliver water to the existing livestock water system that is presently being used in the winter through canal systems, since a Utah Power and Light water line has not been fully operational. The newly constructed line from Cottonwood Creek to the towns of Orangeville and Castledale would also provide raw water to each town's water treatment plant. Presently, raw water is being delivered year round through the Mammoth Canal. As a result of the pressurized pipeline, Mammoth Canal would not be used in the winter.

The Price and San Rafael River basins generally can be divided into three zones or ecosystems which are: the upper or mountainous; mid or irrigated farmland, and, lower or desert rangelands (Bailey, 1976). The areas of these zones are not equal, however. High on the mountainous Wasatch Plateau, the habitat is characterized by high precipitation, relatively lush mountain meadows, and conifer and aspen forests. Winters are cold with extensive snow cover while summers are cool, and the surface water quality is good. The proposed project would not affect this upper zone.

The midsection, or irrigated farmland zone of about 47,000 acres is the proposed project area. It lies between 5,000 and 6,000 feet in elevation and is near the transition zone between mountain and desert habitats. The vegetative cover types are a patchwork pattern of monotypic cultivated plant

species interrupted by dry shrubland ridges, poorly drained wetland areas in the low spots, and riparian habitat along streams, drains, and canals. Crops include irrigated grassland pastures (45 percent), alfalfa (42 percent), small grains, corn, fruit orchards, and potatoes (CH₂M Hill 1983). Farm operations repeatedly disturb the ground cover throughout the year in the irrigated cropland by plowing, mowing, combining, or spraying. The fields are usually left devoid of protective cover for wildlife after harvest.

The dry shrubland ridges support a plant community of big sagebrush (Artemesia tridentata), rabbitbrush (Chrysothamnus nauseosus), antelope bitterbrush (Purshia tridentata), cheatgrass (Bromus tectorum), wheatgrass (Agropyron sp.), Indian ricegrass (Oryzopsis asperifolia), pinyon (Pinus edulis) and Junipers (Juniperus osteosperma and J. scopulorum). The shrubland plant community is maintained only by the annual precipitation.

The wetland (palustrine emergent wetland) vegetation includes cattail (Typha latifolia), hardstem bulrush (Scirpus acutus), alkali bulrush (Scirpus pallidus), rushes (Juncus sp.) and sedges (Carex sp.), saltgrass (Distichlis sp.) and various combinations of plants which collectively are known as wet meadows. Open standing water may also be found in this vegetative community.

Riparian (palustrine forested and/or palustrine scrub-shrub) habitats are also wetland systems that are found bordering streams, ponds, drains and canals. Riparian habitats may be dominated by overstories of cottonwoods (Populus sp.), willows (Salix sp.), Russian olive (Elaeagnus angustifolia), tamarisk (Tamarix gallica), or black greasewood (Sarcobatus vermiculatus). The understory includes various forbs and grasses.

CH₂M Hill, a consulting firm working for the Bureau of Reclamation, made a wetland survey in a previous study using the infrared aerial photos technique (CH₂M Hill, 1984). That study found the following amounts of wetland/riparian habitats displayed in Table I.

TABLE I

Amounts of Wetland and Riparian Habitats in the Price and San Rafael River Basins.

<u>Price River Basin</u>	
Wetlands	8,000 Acres
Riparian	2,850 Acres along the Price River
Total Price River Basin	10,850 Acres
<u>San Rafael River Basin</u>	
Wetlands	11,000 Acres
Riparian	3,400 Acres along San Rafael River
	2,740 Acres along Cottonwood, Ferron, Huntington, and Rock Canyon Creeks.
Total San Rafael Basin	17,140 Acres

FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

The Soil Conservation Service determined that there were 14,390 acres of wetland/wildlife habitats in the project area. They divided wetland types and acreage as follows: pasture/hay wetlands, 9,010 acres; grass/sedge, 1,688 acres; rush/cattail, 381 acres; and riparian tree/shrub, 3,311 acres (Soil Conservation Service, 1989). The difference between the two reports is probably not significant because it is not known for sure that both area boundaries coincide.

Desert Lake Wildlife Management Area (WMA) was acquired and developed for the Utah Division of Wildlife Resources to manage as a wetland area mitigating wetland losses caused by construction of Joe's Valley Reservoir. Acquisition of land and water rights and development was mostly financed with Section 8 funds of the Colorado River Storage Project Act. Operation and management of Desert Lake WMA is in part funded by money from the Federal Aid U.S. Wildlife Restoration Act funds, and the balance from the Utah Division of Wildlife Resources. A number of water rights provide water to operate and manage the WMA, with some owned by the U.S. Fish and Wildlife Service (United States Government) and others owned by the Utah Division of Wildlife Resources (State of Utah). Desert Lake WMA is a wildlife management complex of about 2,000 acres of marsh, 540 acres of open water, and some upland habitats.

Olsen reservoir is another wetland area in Emery County that has about 200 acres of marsh and open water.

Wildlife use of riparian habitat is greatly disproportionate to its occurrence in nature. It is heavily used and important to wildlife for food and cover. Mule deer need it for resting and hiding cover, fawning habitat and a source

of food and water. Red fox, coyotes and other mammals use it for feeding habitat and travel lanes, while birds use it for feeding, nesting and winter shelter. One active golden eagle nest is located atop a cottonwood tree on the Rasmussen canal bank. It has a record of fledging eaglets over the past several years.

The combined wetland and riparian habitats are essential to wildlife in the project area. Wetland and riparian habitats provide nearly all the safe hiding, resting, winter shelter and wildlife nesting/birthing habitat and therefore are ranked as critical habitat values by the Utah Division of Wildlife Resources.

Long-billed curlew are found in wet-meadow type wetlands. The long-billed curlew is a Category 2 candidate species for listing under the Federal Endangered Species Act (Act). Listing is possibly appropriate for Category 2 candidate species, but conclusive data are not currently available.

Project area wetlands are important to several migratory nongame birds of management concern in the United States (U.S. Fish and Wildlife Service 1987). The 1987 list prepared by the U.S. Fish and Wildlife Service (Service) shows that of the 12 birds occurring in Region 6, which includes Utah, 3 are found in the project area (Service 1987). Those three birds are: white-faced ibis, northern harrier (marsh hawk), and loggerhead shrike. Primary reason(s) for listing each are, white-faced ibis and northern harriers - restricted/vulnerable habitat (wetlands) while the loggerhead shrike was listed because of an apparent negative breeding bird survey trend.

A significant, but mostly unappreciated value of the wetlands found throughout the Price-San Rafael area is their role in supporting the prey base so necessary for raptors and other carnivorous animals including loggerhead shrike, weasels, etc.

Below the project area in the Price and San Rafael River basins the upland habitat consists of dry desert shrub types dominated by fourwing saltbush (*Atriplex canescens*), mat saltbush (*A. cuneata*), winterfat (*Eurotina lanata*), black greasewood (*Sarcobatum vermiculatus*), and galleta grass (*Hilaria jamesii*). The streams are saline, turbid and of generally poor quality. The proposed project would not affect the vast area of desert shrub uplands, however, some downstream aquatic and riparian habitat and the wildlife dependent on it would be affected by the project.

The Price River and its mountain tributaries have good gamefish populations of brown, rainbow and cutthroat trout upstream from the proposed project area. As the water is diverted for agriculture, industrial and municipal use, the gamefish populations are eliminated and only a few non-game species remain. Below the project area return flows increase the streamflow and permanency of the Price River. Channel catfish and various non-game fish are found in the lower Price River. Channel catfish are game fish while the non-game fish provide food for great blue herons, common mergansers, and other fish eating birds.

The mountainous tributaries of Huntington, Cottonwood and Ferron Creeks, which converge and form the San Rafael River, support brown, rainbow and cutthroat trout above stream diversions. Below these diversions in the project area, game fish nearly disappear because of dewatering and only a few remnants of game fish and non-game fishes remain. The San Rafael River and its tributaries in the project area and below supports only non-game fish.

The Utah Division of Wildlife Resources (Division) considers the roundtail chub (*Gila robusta*) a sensitive non-game fish (Utah Division of Wildlife Resources 1987). Roundtail chubs are found in both the Price and San Rafael rivers and in the lower reaches of Huntington, Ferron and Cottonwood Creeks. This species appears to be on the decline in Utah.

The terrestrial and aquatic habitat in the Price and San Rafael basins support approximately 90 species of mammals, 270 species of birds and 30 species of fish. Since the proposed project would primarily affect the irrigated farmland zone and some riparian and aquatic habitat below the project, not all types of wildlife found in the Price and San Rafael drainages would be affected by the project. A joint study made in 1977-1978 by the Division and Soil Conservation Service inventoried the mammals and birds inhabiting or utilizing irrigated farmlands, potentially irrigable rangelands, and wetlands in the Price and San Rafael River drainages of Carbon and Emery Counties (Division 1978). In that study 23 species of mammals and 120 species of birds were recorded. Of the 120 species of birds 79 species were found utilizing wetlands, while twenty three species were found only in wetland habitat (Tables II and III). Population densities of wetland-inhabiting birds per 100 acres were found in the same study to range up to 7207.5 for red-winged blackbirds (Table IV). Wetland habitat is essential to the birds found only in wetlands. It also furnishes the required winter and nesting habitat for ring-necked pheasants and breeding, nesting and wintering habitats for red-winged and yellow-headed blackbirds.

Twelve species of mammals utilized wetlands as well as rangeland and/or farmlands (Table V) while 11 species utilized only rangelands and/or farmland (Table VI).

Table II

Birds Inhabiting or Utilizing Wetlands in Emery County, Utah During 1977 and 1978 Study

Great blue heron	Spotted sandpiper
Snowy egret	Lesser yellowlegs
Black-crowned night heron	Least sandpiper
White-faced ibis	American avocet
Canada goose	Black-necked stilt
Mallard	Wilson's phalarope
Gadwall	Northern phalarope
Pintail	California gull
Blue-winged teal	Forster's tern
Green-winged teal	Mourning dove
Cinnamon teal	Long-eared owl
Redhead	Short-eared owl
Canvasback	Common night hawk
Turkey vulture	White-throated swift
Sharp-shinned hawk	Common flicker
Cooper's hawk	Western kingbird
Golden eagle	Eastern kingbird
Red-tailed hawk	Horned lark
Rough-legged hawk	Violet-green swallow
Northern harrier (Marsh hawk)	Tree swallow
Merlin	Bank swallow
Prairie falcon	Rough-winged swallow
American kestrel	Barn swallow
Ring-necked pheasant	Cliff swallow
Killdeer	Black-billed magpie
Common snipe	American crow
Long-billed curlew	Great horned owl
Black-capped chickadee	Common raven
Long-billed marsh wren	Western meadowlark
Mountain bluebird	Yellow-headed blackbird
American robin	Red-winged blackbird
Cedar waxwing	Brewer's blackbird
Loggerhead shrike	Brown-headed cowbird
European starling	Savannah sparrow
Yellow-rumped warbler	Grasshopper sparrow
Common yellowthroat	Vesper sparrow
Dark-eyed junco	Lark sparrow
Pine siskin	Tree sparrow
	Lincoln sparrow
	Song sparrow
	Brewer's sparrow
	White-crowned sparrow

Table III

List of Birds Found Only In Wetland Habitat In The Carbon and Emery Counties
Study Area

Snowy egret	Least sandpiper
Black-crowned night heron	Wilson's phalarope
Gadwall	Northern Phalarope
Pintail	Forster's tern
Blue-winged teal	White-throated swift
Cinnamon Teal	Tree swallow
Green-winged teal	Bank swallow
Redhead	Rough-winged swallow
Canvasback	American crow
Sharp-shinned hawk	Long-billed marsh wren
Long-billed curlew	Lincoln sparrow
Spotted sandpiper	
Lesser yellowlegs	

Utah Division of Wildlife Resources, 1978.

Table IV

Densities per 100 Acres of Selected Avian Species Found Inhabiting Wetlands in
the Price- San Rafael Salinity Control Project Area

Species	Density per 100 acres
snowy egret	3.2
black-crowned night heron	8.0
gadwall	3.2
pintail	P*
cinnamon teal	4.8
blue-wing teal	P
redhead	F**
canvasback	F
long-billed curlew	P
spotted sandpiper	P
least sandpiper	64.0
lesser yellowlegs	4.8
Wilson's phalarope	27.2
northern phalarope	3.2
forster's tern	P
long-billed marsh wren	68.8
red-winged blackbird	7,207.5
yellow-headed blackbird	507.5
ring-necked pheasant	68.8

*P - Present but data collected was not sufficient to determine density.

**F - Species observed in flight over transect area.

Table V

Mammals Inhabiting or Utilizing Wetlands in Emery County Utah
During 1977-1978 Study

Western harvest mouse
Deer mouse
Mountain vole
Meadow vole
Muskrat
Black-tailed jackrabbit
Long-tailed weasel
Red fox
Striped skunk
Coyote
Mule deer
House cat

Table VI

Mammals Utilizing Farmland and Rangeland But Not Found In Wetland Habitats
(Division 1978)

White-tailed jackrabbits	Ord kangaroo rat
Cottontail	Great Basin pocket mouse
White-tailed prairie dog	Western harvest mouse
Rock squirrel	House mouse
Golden-mantled ground squirrel	Badger
White-tailed antelope squirrel	

Endangered Species

Five listed endangered species may occur in the project area and three listed fish species are found in the Green River below the confluences of the Price and San Rafael Rivers. The listed species are shown in Table VII.

Table VII

Endangered Species Found or Potentially Found in the Price - San Rafael Salinity Project Area and in the Green River Below the Confluences of the Price and San Rafael Rivers.

Common Name	Scientific Name	Status
Black-footed ferret	<u>Mustela nigripes</u>	E
Maguire daisy	<u>Erigeron maguirei</u> var. <u>maguirei</u>	E
San Rafael cactus	<u>Pediocactus despainii</u>	E
Bald eagle	<u>Haliaeetus leucocephalus</u>	E
Peregrine falcon	<u>Falco peregrinus</u>	E
Bonytail chub	<u>Gila elegans</u>	E
Humpback chub	<u>Gila cypha</u>	E
Colorado squawfish	<u>Ptychocheilus lucius</u>	E
Razorback sucker	<u>Xyrauchen texanus</u>	E

E = Endangered

FISH AND WILDLIFE RESOURCES WITH THE PROJECT

The Preliminary Environmental Assessment, Price - San Rafael River Basin, Salinity Control Program (SCS 1989) presented four alternatives with wide ranging environmental impacts. The following impact analysis evaluates only the "resource protection (RP) alternative" (identified in enclosures to a September 13, 1989 letter from Frank Holt, State Conservationist as the selected plan). If the selected plan is modified or changed in any way which affects fish and wildlife resources, this analysis and the subsequent recommendations would need to be updated.

The project will cause significant impacts to fish and wildlife habitats both in and out of the project area. Those impacts will cause wildlife population losses and reduce the recreation and income that the affected species generate. Project completion will:

- (1) cause the loss of 6,926 acres of wetland and riparian habitats and their dependent wildlife,
- (2) reduce streamflow in the habitats of the roundtail chub (Gila robusta), a native Utah Wildlife Species of Special Concern, in the Price and San Rafael Rivers, and Huntington, Ferron, and Cottonwood Creeks,
- (3) reduce streamflow by 25,310 acre feet per year in the occupied habitats of the Green River of the endangered Colorado squawfish, bonytail chub, humpback chub and razorback sucker,
- (4) disturb 395 acres of upland habitat when the pipelines are put in. This is a one time disturbance and will be a short-term loss.

The off-farm (Reclamation) and on-farm (SCS-ASCS-landowner) actions will contribute unevenly to the overall project impacts; therefore, project impacts caused by each are discussed separately.

Off-Farm (Reclamation) actions will result in:

- (1) the loss of 71 acres of wetlands and 159 acres of riparian habitats,
- (2) depletion of 2,850 acre feet of water in the occupied habitats in the Green River of the Colorado squawfish, bonytail chub, humpback chub and razorback sucker, and in occupied habitats of the roundtail chub in the Price and San Rafael Rivers and Huntington, Ferron and Cottonwood Creeks,
- (3) short term loss of 395 acres of upland habitat.

Replacing 53.4 miles of off-farm laterals with a pressurized pipeline will cause the loss of 40.3 acres of wetland and 33 acres of riparian habitats in the Price River basin, while replacing 57.1 miles of laterals and 6.8 miles of the Cottonwood Creek Canal will cause the loss of 11.5 acres of wetlands and

125.8 acres of riparian habitat. The lost wetland/riparian habitats resulting from abandoning laterals have generally long and narrow shapes thereby presenting more edge in relationship to the area of the habitat lost, a valuable asset for wildlife. Approximately 19 acres of wetlands adjacent to stockponds would be converted to upland habitat.

Three hundred ninety five acres of upland habitat will be disturbed when the pipelines are put in. This is a one time disturbance and will be a short-term loss.

On-farm (SCS-ASCS-landowner) actions will result in:

- (1) the loss of 6,696 acres of wetlands (5,630 wetlands and 1,066 riparian),
- (2) depletion of 22,460 acre-feet of water per year in the occupied habitats in the Green River of the Colorado squawfish, bonytail chub, humpback chub and razorback sucker,
- (3) reduced stream flows in the occupied habitats of the roundtail chub in the Price and San Rafael Rivers and Huntington, Cottonwood and Ferron Creeks.

The underlying cause for wetland losses and streamflow depletions is the increased efficiency in water delivery and water use. No more water will be diverted, or used, in post-project times than in pre-project times. Leaks and deep percolation will be eliminated when pressurized pipelines are operational and winter water deliveries through canals are halted. Lined stocktanks will reduce the deep percolation that previously leaked from the unlined stockponds. Leaked and deep percolated waters that supported wetland and riparian habitats and contributed to streamflows further down the drainage will no longer be available for those wildlife habitats.

The improved irrigation efficiency gained by converting from flood irrigation to sprinkler system will reduce the amount of water supporting wetlands and deep percolation that supports wetland/riparian habitats and downstream return flows. Sprinklers will distribute water more evenly over the irrigated fields that in turn will support more plants per unit area, increasing the number of plants per field. The additional plants will increase the amount of water lost through evaporation and transpiration. Even distribution of water will also reduce rapid runoff and avoid ponding that results in less water being available to support wetlands, deep percolation, and downstream flows.

The effects of average annual depletion of 25,310 acre-feet in the occupied habitats in the Green River of the Colorado squawfish, bonytail chub, humpback chub and razorback sucker are addressed in a separate biological opinion, included as Appendix B of this report.

The roundtail chub occurs in Cottonwood, Ferron and Huntington Creeks and the Price and San Rafael Rivers. Little is known about the habitat requirements of this species, especially in streams tributary to the Green River. One of the concerns for the endangered humpback chub and bonytail chub is loss of

genetic integrity through hybridization with roundtail chub in the mainstem Green and Colorado River. The tributaries may therefore provide very important habitat in maintaining isolation during the spawning period.

Roundtail chubs spawn in June and July in the mainstem Colorado River when flows are descending and water temperature ranges from 12-17° C (Archer et al 1985). Successful spawning and recruitment of young fish to the population is often a major factor in a species survival in manipulated water systems. Depletions in Cottonwood and Huntington Creeks and the Price River resulting from implementing this project will be greatest in June and July. Percent changes in flow range from 7.7 in June in the Huntington Creek to -49.2 in July in the Price River. Flows in Ferron Creek will be reduced more than 50 percent five months out of the year including 52.3 percent in July. The San Rafael River will experience flow reductions of 18.6 and 38.6 percent in June and July, respectively. These flow reductions are significant, occur at a very critical time in the roundtail chub life cycle and will result in serious adverse impacts to the species. Tables VIII-XII illustrate changes in flow for the five streams resulting from implementation of the project.

TABLE VIII
COTTONWOOD CREEK - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	4.55	4.34	-0.21	-4.6%
NOV	1.47	1.38	-0.09	-6.1%
DEC	1.18	1.17	-0.01	-0.8%
JAN	1.08	0.99	-0.09	-8.3%
FEB	1.08	0.99	-0.09	-8.3%
MAR	1.88	1.79	-0.09	-4.8%
APR	2.40	2.20	-0.20	-8.3%
MAY	9.27	8.88	-0.39	-4.2%
JUNE	16.60	14.84	-1.76	-10.6%
JUL	7.20	5.70	-1.50	-20.8%
AUG	5.03	4.65	-0.38	-7.6%
SEP	5.04	4.94	-0.10	-2.0%
TOTAL (AVG. ANNUAL)	56.78	51.87	-4.91	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

^{1/}FWOP = Future without project

^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River (selected plan).

Soil Conservation Service 1989

TABLE IX
FERRON CREEK - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	0.47	0.28	-0.19	-40.4%
NOV	0.32	0.21	-0.11	-34.4%
DEC	0.16	0.14	-0.02	-12.5%
JAN	0.16	0.07	-0.09	-56.3%
FEB	0.16	0.07	-0.09	-56.3%
MAR	0.16	0.07	-0.09	-56.3%
APR	0.38	0.23	-0.15	-39.5%
MAY	0.61	0.30	-0.31	-50.8%
JUN	12.55	11.07	-0.48	-11.8%
JUL	2.39	1.14	-1.25	-52.3%
AUG	1.30	0.98	-0.32	-24.6%
SEP	0.92	0.82	-0.10	-10.9%
TOTAL (AVG. ANNUAL)	19.58	15.38	-4.2	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

- ^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

Soil Conservation Service 1989

TABLE X
HUNTINGTON CREEK - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	3.13	3.01	-0.12	-3.8%
NOV	2.02	1.96	-0.06	-3.0%
DEC	1.81	1.80	-0.01	-0.6%
JAN	1.71	1.65	-0.06	-3.5%
FEB	1.71	1.65	-0.06	-3.5%
MAR	2.21	2.15	-0.06	-2.7%
APR	3.42	3.32	-0.10	-2.9%
MAY	18.20	17.97	-0.23	-1.3%
JUN	13.78	12.72	-1.06	-7.7%
JUL	4.58	3.69	-0.89	-19.4%
AUG	5.15	4.93	-0.22	-4.3%
SEP	3.32	3.26	-0.06	-1.8%
TOTAL (AVG. ANNUAL)	61.04	58.11	-2.93	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

- ^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

Soil Conservation Service 1989

TABLE XI

PRICE RIVER - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	4.96	4.58	-0.38	-7.7%
NOV	2.83	2.64	-0.19	-6.7%
DEC	2.04	2.04	0.00	0.0%
JAN	1.67	1.48	-0.19	-11.4%
FEB	1.38	1.19	-0.19	-13.8%
MAR	6.01	5.82	-0.19	-3.2%
APR	9.36	8.97	-0.39	-4.2%
MAY	15.85	15.06	-0.79	-5.0%
JUN	13.02	9.36	-3.66	-28.1%
JUL	5.08	2.58	-2.50	-49.2%
AUG	4.44	3.79	-0.65	-14.6%
SEP	4.41	4.35	-0.06	-1.4%
TOTAL (AVG ANNUAL)	<u>71.05</u>	<u>61.86</u>	<u>-9.19</u>	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

- ^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

Soil Conservation Service 1989

TABLE XII

SAN RAFAEL - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	4.32	3.74	-0.58	-13.4%
NOV	3.42	3.13	-0.29	-8.5%
DEC	2.36	2.34	-0.02	-0.8%
JAN	1.92	1.66	-0.26	-13.5%
FEB	2.99	2.73	-0.26	-8.7%
MAR	5.05	4.79	-0.26	-5.1%
APR	5.07	4.56	-0.51	-10.1%
MAY	11.71	10.67	-1.04	-8.9%
JUN	25.10	20.43	-4.76	-18.6%
JUL	10.39	6.38	-4.01	-38.6%
AUG	4.64	3.58	-1.06	-22.8%
SEP	4.03	3.72	-0.31	-7.7%
TOTAL (AVG ANNUAL)	<u>81</u>	<u>67.73</u>	<u>-13.27</u>	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

- ^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

Soil Conservation Service 1989

Table XIII

Water budgets for Desert Lake Waterfowl Management Area and Olsen Reservoir

	DESERT LAKE		OLSEN RESERVOIR	
	FWOP PLAN	RP PLAN	FWOP PLAN	RP PLAN
INFLOW (Acre Feet)				
Irrg. Rtn. Flows ^{1/}	6300 ^{8/}	3000	2100	900
Spillage (canal) ^{2/}	3000	2500	1000	850
Annual Precip. ^{3/}	9800	9800	3900	3900
Irrg. Water Right ^{4/}	1300	1300	-	-
Total	<u>20400</u>	<u>16600</u>	<u>7000</u>	<u>5650</u>
OUTFLOW (Acre Feet)				
Evaporation	2600	2600	475	475
Water Flow Thru ^{5/}	15600	11800	6125	4875
Total ^{6/}	<u>18200</u>	<u>14400</u>	<u>6600</u>	<u>5250</u>
Capacity (Acre Feet)	2200	2200	400	400
Surface Area (Ac) ^{7/}	544	544	100	100

To obtain cubic feet per second (cfs), averaged for a year, multiply acre feet by 0.0014.

- ^{1/} Irrigation Return Flows - Includes canal seepage loss, irrigation deep percolation loss, surface runoff from farms.
^{2/} Spillage - Includes early spring spillage (unused irrigation water).
^{3/} Annual Precipitation - Total annual precipitation contribution
^{4/} Irrigation Water Right - Water Rights owned by the Division of Wildlife Resources.
^{5/} Water Flow Through - Water that flows through the Reservoir or Lake.
^{6/} Total represents inflow minus capacity.
^{7/} Surface Area (Acres) - Area of open water.
^{8/} All flows are average annual and have been rounded.

A loss of 6,696 acres of wetland habitats will result in:

1. loss of waterfowl nesting, brooding and resting habitats
2. loss of habitat for upland game and mule deer
3. loss of habitat for long-billed curlew, a Category 2 candidate species,
4. loss of nesting and feeding habitat for northern harrier and white-faced ibis and feeding habitat for loggerhead shrike, all migratory nongame birds of management concern in the United States.
5. loss of habitat supporting prey base for raptors including northern harrier, rough-legged hawk and American kestrel.
6. Undetermined economic loss of some portion of \$4 million (1985 dollars) spent annually by hunters hunting in the project area of Carbon and Emery Counties (Table XIV)

Table XIV

Expenditures For Wildlife Oriented Recreation On Project Area - * 1985

	Carbon	Emery	Total
Upland Game (pheasants, quail, cottontail)	\$393,456	\$568,680	\$962,136
Mourning Dove	171,720	165,024	336,744
Waterfowl (Desert Lake only)		39,096	39,096
Trappers Pelt Value	35,413	35,024	70,437
Nonconsumptive Wildlife Oriented Recreation (16 yrs. old & over)	1,696,085	855,345	<u>2,551,430</u>
Grand Total			\$3,959,843

* Estimates based on total expenditures in Utah, multiplied by the proportion of hunter days spent in Carbon or Emery counties; or, in the case of nonconsumptive use, by the proportion of the state's population in those counties.

Source: U.S. Fish and Wildlife Service, 1988
Utah Division of Wildlife Resources, 1985
Utah Division of Wildlife Resources, 1986a
Utah Division of Wildlife Resources, 1986b

Waterfowl, primarily mallard, cinnamon teal, gadwall and Canada geese now regularly using these wetlands for nesting, brood rearing and resting will no longer have them available following project completion. While these losses will not be significant when compared to the numbers of those species in the Pacific Flyway, they will contribute to the overall Flyway population declines that are of concern. Concerns over wetland loss has generated numerous laws, orders, and rules and regulations requiring all Federal agencies to avoid taking actions which will cause a net loss of wetlands, yet, over 400,000 acres are being lost annually, and some through Federal funding or other assistance. Those laws, orders, and rules and regulations include, but are not limited to; Executive Order 11990, Protection of Wetlands; National Environmental Policy Act; Section 404 of the Clean Water Act; the Swampbuster Provisions of the Food Security Act of 1985; and others which are supposed to achieve wetlands protection.

The loss of 4,846 acres of pasture/hay, 632 acres of grass/sedge, and 1,066 acres of riparian tree/shrub wetland types will reduce the vitally needed safe nesting cover for ring-necked pheasants. Safe nesting cover is the most important habitat pheasants and other ground nesting birds need under today's farming practices. While safe nesting cover is the most important habitat need for pheasants, winter cover is important too. Loss of rush/cattail, riparian tree/shrub, and to some extent, grass/sedge wetland types will

severely reduce winter cover. Project-caused pheasant habitat losses are likely to reduce the pheasant population below that which would support hunting.

Mule deer now using the 3,311 acres of riparian tree/shrub and 381 acres of rush/cattail habitats would no longer have this cover available once the project is operational. Deer numbers would be reduced and some hunting opportunity lost; however, if nonmigratory deer are causing damage to crops, it may be relieved. Deer damage caused by migratory populations will not be affected.

Mourning dove, cottontail rabbit and quail habitat loss will reduce their numbers by some unknown amount.

The loss of 4,846 acres of pasture/hay wetlands and 632 acres of sedge/grass wetlands will reduce nesting, brooding, and feeding habitats for long-billed curlew. The reason for the long-billed curlew population decline is habitat loss. This project will contribute to that problem.

Project-caused loss of 4,846 acres of pasture/hay, 632 acres of grass/sedge, and 152 acres of rush/cattail wetlands will contribute to the loss of nesting, brooding, and feeding habitats of northern harrier and white-faced ibis. These two birds are migratory non-game birds of management concern in the United States because of population declines caused by habitat loss. Northern harriers are common residents of project wetlands while white-faced ibis are present, but not common. The loss of the project area wetlands will decimate those populations in the project area.

Possibly the most important value of the 6,696 acres of wetland habitats lost is their role in supporting raptors and carnivorous mammals' prey base. Most conspicuous species are rough-legged hawks during the winter; American kestrel and northern harriers in the summer; and red-tailed hawks year round. Less conspicuous species include long-eared, and great horned owls. Mammals include skunks and long-tailed weasels.

The project caused loss of wildlife habitat will reduce wildlife-related recreation expenditures in Carbon and Emery Counties to some undetermined level.

DISCUSSION/MITIGATION/ENHANCEMENT

Creating new in-kind wetlands in most of the project area to replace the wetlands destroyed by project implementation would be counter-productive to project purposes. The salt loading eliminated by reducing deep percolation from existing wetlands would be shifted to the newly created mitigation wetlands where deep percolation would again leach out salts from the soils. Therefore, in the spirit of cooperation with the effort to reduce salt from Colorado River water, out-of-kind mitigation is recommended.

The Service has worked with the Division in preparing an out-of-kind mitigation proposal to compensate for the wetland habitats lost by

implementing the Price-San Rafael salinity control project. A primary objective of mitigation for wetland losses should be one-for-one, in-kind replacement of values lost. Out-of-kind mitigations are acceptable only when in-kind options are impractical such as in this project.

Reclamation has informally committed to mitigating the 230 acres of riparian/wetlands that would be lost due to their portion of the project. No commitment to compensate for wetland losses has been forwarded from the SCS - ASCS - landowner project participants at this time. The Colorado River Basin Salinity Control Act, as amended (P.L. 93-320) and its implementation by the Department of Agriculture provide for voluntary replacement of "fish and wildlife values foregone." However, the Fish and Wildlife Service cannot credit mitigation measures for wildlife habitat losses without a commitment or guarantee that they will be completed. Therefore, it is the Service position that wildlife habitat losses associated with the on-farm implementation of this project are unmitigated losses.

The biological opinion included as Appendix B to this report addresses impacts to the endangered Colorado squawfish, bonytail chub, humpback chub and razorback sucker. Compliance with requirements of the Endangered Species Act is accomplished through that document.

RECOMMENDATIONS

In order to partially offset wetland losses we propose that the project participants purchase the floodplain lands of Cottonwood, Ferron, and Huntington Creeks from Highway U-10 to the San Rafael River and the flood plains of the San Rafael River downstream to North Salt Wash in Emery County in fee title. In Carbon County we recommend purchasing the flood plains in fee title from Willow Creek downstream to Soldier Creek. The stream miles, acreage and present land ownership are displayed in Table XV. Water, water distribution systems, access roads and fences should also be provided by project participants to facilitate management.

Presently the riparian and upland habitat in the proposed mitigation lands are severely overgrazed; however, with management and control these habitats could be improved. In the proposed area, wetlands can be improved where they exist, or created, by water management along these streams. Salt pick-up should be negligible because wetland development would be in the streamside alluvium where salts have been already leached out. This would not conflict with project purposes.

It should be pointed out that the proposed out-of-kind mitigation would not reduce (replace) project caused wetland losses. Only newly developed wetlands from non-wetland habitats would do that; however, some wildlife values such as safe pheasant nesting, brooding and winter cover and deer hiding cover would in part be recovered in this out-of-kind mitigation. A deficit of 6,926 acres of wetland/riparian habitat would remain, as well as the loss of habitat needed by white-faced ibis, long-billed curlew, northern barrier and other wildlife species previously described. Public use opportunity would be increased by the out-of-kind mitigation.



In Reply Refer To

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
UTAH STATE OFFICE
2078 ADMINISTRATION BUILDING
1745 WEST 1700 SOUTH
SALT LAKE CITY, UTAH 84104-5110



(FWE)

February 4, 1992

6-UT-84-F-0030

MEMORANDUM

TO: Regional Director, Upper Colorado Region, Bureau of Reclamation, Salt Lake City, Utah

FROM: Field Supervisor, Fish and Wildlife Enhancement, Utah/Colorado Field Office, Salt Lake City, Utah

SUBJECT: Biological Opinion for the Price-San Rafael River Unit of the Colorado River Water Quality Improvement Program.

This responds to your memorandum of May 19, 1988 transmitting your biological assessment for the subject project. Additional information (the Environmental Evaluation Appendix) was received on August 9, 1988. The Federal action subject to Section 7 consultation according to the Endangered Species Act of 1973, as amended, is a joint decision by the Bureau of Reclamation and Soil Conservation Service recommending construction of the subject project. Your biological assessment and environmental evaluation concluded that the depletion of 25,623 acre feet of water may affect the Colorado squawfish (*Ptychocheilus lucius*), humpback chub (*Gila cypha*) and bonytail chub (*Gila elegans*), thus requiring the initiation of formal Section 7 consultation. The Razorback sucker (*Xyrauchen texanus*) has since been listed as an endangered species and we believe may be affected by the proposed project. This species has therefore been included in discussions and concluded biological opinion. In subsequent phone conversations with local representatives of the Soil Conservation Service on October 4, 1990, the total average annual depletion has been revised to 25,310 acre feet. The project is a cooperative effort among the Bureau of Reclamation (Bureau); Department of Agriculture (USDA) agencies (Soil Conservation Service (SCS) and Agriculture Stabilization and Conservation Service (ASCS)); and private land owners to reduce salinity in the Price-San Rafael Rivers Unit of the upper Colorado River Basin. The Bureau has agreed to take the lead in planning, including Endangered Species Act compliance.

Other endangered and threatened species which may be found in the area of influence of this proposed action include:

Black-footed ferret (<i>Mustela nigripes</i>)	E
Maguire daisy (<i>Erigeron maguirei</i> var. <i>maguirei</i>)	E
San Rafael cactus (<i>Pediocactus despainii</i>)	E
Jones cycladenia (<i>Cycladenia humilis</i> var. <i>jonesii</i>)	T
Bald eagle (<i>Haliaeetus leucocephalus</i>)	E

Peregrine falcon (Falco peregrinus)

E

The Fish and Wildlife Service (Service) concurs with the Bureau's conclusion in the biological assessment that the proposed action will not adversely affect the Maguire daisy, Jones cycladenia, San Rafael cactus, bald eagle, peregrine falcon, or black-footed ferret. No further consultation is required for those species. Also, the Service concurs with your determination of "may affect" for the Colorado River fishes. This biological opinion addresses impacts of the proposed action to those species. This report constitutes the U.S. Fish and Wildlife Service's Biological Opinion for the Price - San Rafael River Unit and has been prepared in accordance with Section 7 of the Endangered Species Act (16 U.S.C. 1531 et seq.) and the Interagency Cooperation Regulations (50 CFR 402).

BIOLOGICAL OPINION

Based on the best scientific and commercial information currently available, the depletion of 25,310 acre-feet of water from the Green River caused by completion of the Price-San Rafael Salinity Control Project is not likely to jeopardize the continued existence of the Colorado squawfish, humpback chub, razorback sucker and honytail chub provided the following conservation measures are agreed to:

- (1) The SCS assures that before project implementation is initiated by SCS that a funding source will be identified to pay a depletion charge of \$11.50/acre foot for a total of 22,460 acre feet to offset its major depletion. Ten percent of this charge is due at the time of project authorization.
- (2) That all parties recognize that additional measures may be required to offset the 22,460 acre feet depletion if "sufficient progress" as determined by the Service and the Recovery Team is not realized in the Recovery Implementation Program (RIP) at the time construction funds are appropriated. SCS will not initiate USDA construction until appropriate required measures have been addressed. The conservation measures are further discussed on pp. 20-21 of this document.

PROJECT DESCRIPTION

The Bureau, SCS, and private landowners with financial assistance from the ASCS are proposing to: (1) to develop a pressurized sprinkler irrigation system from the canals including other salinity control measures, in the Price-San Rafael Rivers Unit of the Colorado River Salinity Control Program, and (2) improve winter livestock watering practices by providing culinary water at subsidized rates, lining stock ponds, making improvement to the existing Cottonwood Creek livestock watering system, and constructing a pipeline to deliver raw water to the Orangeville and Castledale water treatment plants. The proposed project would result in a depletion of 25,310 acre feet of water in the Upper Colorado River System. The Bureau's action would result in 2,850 acre feet of the total depletion by reducing seepage

from canals and stock ponds while the USDA agencies and private landowner's actions and funding would reduce water by another 22,460 acre feet by increasing evaporation-transpiration water losses through an increase in the number of stems per acre in the irrigated fields.

The depletion will actually occur in Cottonwood, Ferron, and Huntington Creeks (tributaries to the San Rafael River), and in the Price and San Rafael Rivers. The depletion in the Green River will be at and below the confluence of the Price River at River Mile (RM) 138, and at and below the confluence of the San Rafael River at RM 97. The depletion will occur year round and will be greatest in June and July. Tables 1-5 show the average monthly depletions in the affected streams.

TABLE 1
COTTONWOOD CREEK - STREAM FLOW

Month (Water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	4.55	4.34	-0.21	-4.6%
NOV	1.47	1.38	-0.09	-6.1%
DEC	1.18	1.17	-0.01	-0.8%
JAN	1.08	0.99	-0.09	-8.3%
FEB	1.08	0.99	-0.09	-8.3%
MAR	1.88	1.79	-0.09	-4.8%
APR	2.40	2.20	-0.20	-8.3%
MAY	9.27	8.88	-0.39	-4.2%
JUN	16.60	14.84	-1.76	-10.6%
JUL	7.20	5.70	-1.50	-20.8%
AUG	5.03	4.65	-0.38	-7.6%
SEP	5.04	4.94	-0.10	-2.0%
TOTAL (AVG. ANNUAL)	56.78	51.37	-4.91	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River (preferred plan).

Soil Conservation Service 1989

TABLE 2
FERRON CREEK - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	0.47	0.28	-0.19	-40.4%
NOV	0.32	0.21	-0.11	-34.4%
DEC	0.16	0.14	-0.02	-12.5%
JAN	0.16	0.07	-0.09	-56.3%
FEB	0.16	0.07	-0.09	-56.3%
MAR	0.16	0.07	-0.09	-56.3%
APR	0.38	0.23	-0.15	-39.5%
MAY	0.51	0.30	-0.31	-50.8%
JUN	12.55	11.07	-0.48	-11.8%
JUL	2.39	1.14	-1.25	-52.3%
AUG	1.30	0.98	-0.32	-24.6%
SEP	0.92	0.82	-0.10	-10.9%
TOTAL (AVG. ANNUAL)	19.58	15.38	-4.2	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

Soil Conservation Service 1989

TABLE 3

HUNTINGTON CREEK - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	3.13	3.01	-0.12	-3.8%
NOV	2.02	1.96	-0.06	-3.0%
DEC	1.81	1.80	-0.01	-0.6%
JAN	1.71	1.65	-0.06	-3.5%
FEB	1.71	1.65	-0.06	-3.5%
MAR	2.21	2.15	-0.06	-2.7%
APR	3.42	3.32	-0.10	-2.9%
MAY	18.20	17.97	-0.23	-1.3%
JUN	13.78	12.72	-1.06	-7.7%
JUL	4.58	3.69	-0.89	-19.4%
AUG	5.15	4.93	-0.22	-4.3%
SEP	3.32	3.26	-0.06	-1.8%
TOTAL (AVG. ANNUAL)	61.04	58.11	-2.93	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

Soil Conservation Service 1989

TABLE 4

SAN RAFAEL - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	4.32	3.74	-0.58	-13.4%
NOV	3.42	3.13	-0.29	-8.5%
DEC	2.36	2.34	-0.02	-0.8%
JAN	1.92	1.66	-0.26	-13.5%
FEB	2.99	2.73	-0.26	-8.7%
MAR	5.05	4.79	-0.26	-5.1%
APR	5.07	4.56	-0.51	-10.1%
MAY	11.71	10.67	-1.04	-8.9%
JUN	25.10	20.43	-4.76	-18.6%
JUL	10.39	6.38	-4.01	-38.6%
AUG	4.64	3.58	-1.06	-22.8%
SEP	4.03	3.72	-0.31	-7.7%
TOTAL (AVG ANNUAL)	81	67.73	-13.27 ^{3/}	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

^{1/}FWOP = Future without project
^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.
^{3/} = Includes flow depletions from Tables 1-3 (Cottonwood Creek, Ferron Creek, and Huntington Creek)

Soil Conservation Service 1989

TABLE 5

PRICE RIVER - STREAM FLOW

Month (water year)	FWOP ^{1/} acft (1000's)	RP ^{2/} acft (1000's)	Change Amt. (1000's)	Change %
OCT	4.96	4.58	-0.38	-7.7%
NOV	2.83	2.64	-0.19	-6.7%
DEC	2.04	2.04	0.00	0.0%
JAN	1.67	1.48	-0.19	-11.4%
FEB	1.38	1.19	-0.19	-13.8%
MAR	6.01	5.82	-0.19	-3.2%
APR	9.36	8.97	-0.39	-4.2%
MAY	15.85	15.06	-0.79	-5.0%
JUN	13.02	9.36	-3.66	-28.1%
JUL	5.08	2.58	-2.50	-49.2%
AUG	4.44	3.79	-0.65	-14.6%
SEP	4.41	4.35	-0.06	-1.4%
TOTAL (AVG ANNUAL)	71.05	61.86	-9.19	

To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

^{1/}FWOP = Future without project

^{2/}RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

Soil Conservation Service 1989

BASIS FOR OPINION

Water depletions in the Upper Colorado River Basin have been recognized as a major source of impact to associated endangered fish species. Continued water withdrawal has restricted the ability of the Colorado River system to produce flow conditions required by various life stages of the fish. Impoundments and diversions have reduced peak discharges by 50 percent since 1942 while increasing low flows by 21 percent in some reaches. These depletions along with a number of other factors have resulted in such drastic reductions in the populations of Colorado squawfish, humpback chub, bonytail chub and razorback sucker that the Service has listed these species as endangered and has implemented programs to conserve and prevent them from becoming extinct. Both the direct and indirect effect of depletions that will occur as a result of this project as well as cumulative effects are considered in the formulation of this biological opinion.

COLORADO SQUAWFISHStatus

The Colorado squawfish evolved as the main predator in the Colorado River system. The diet of Colorado squawfish longer than 3 or 4 inches consists almost entirely of other fishes (Vanicek and Kramer 1969). The Colorado squawfish is the largest cyprinid fish (minnow family) native to North America and, during predevelopment times, may have grown as large as 6 feet in length and weighed nearly 100 pounds (Behnke and Benson 1983). These large fish may have been 25-50 years of age.

Based on early fish collection records, archaeological findings, and other observations, the Colorado squawfish was once found throughout warm water reaches of the entire Colorado River Basin, including reaches of the upper Colorado River and its major tributaries, the Green River and its major tributaries, and the Gila River system in Arizona (Seethaler 1978). Colorado squawfish were apparently never found in colder, headwater areas. Seethaler (1978) indicates that the species was abundant in suitable habitat throughout the entire Colorado River basin prior to the 1850's. Historically, Colorado squawfish have been collected in the upper Colorado River as far upstream as Parachute Creek, Colorado (Kidd 1977).

A marked decline in Colorado squawfish populations in the upper Colorado River Basin can be closely correlated with the construction of dams and reservoirs during the 1960's, the introduction of non-native fishes, and the removal of water from the Colorado River system. Behnke and Benson (1983) summarized the decline of the natural ecosystem. They pointed out that the dams, impoundments, and water use practices are probably the major reasons for drastically modified natural river flows and channel characteristics in the Colorado River Basin. Dams on the mainstem have essentially segmented the river system, blocking Colorado squawfish spawning migrations and drastically changing river characteristics, especially flows and temperatures. In addition, major changes in species composition have occurred due to the introduction of non-native fishes, many of which have thrived as result of

changes in the natural riverine system (i.e., flow and temperature regimes). The decline of endemic Colorado River fishes seems to be at least partially related to competition or other behavioral interactions with non-native species.

The Colorado squawfish currently occupies about 980 river miles in the Colorado River system (28 percent of its original range) and is presently found only in the upper Colorado River Basin above Glen Canyon Dam. It inhabits about 350 miles of the mainstem Green River from its mouth to the mouth of the Yampa River. Its range also extends 140 miles up the Yampa River and 104 miles up the White River, the two major tributaries of the Green River. In the mainstem Colorado River, it is currently found from Lake Powell extending about 201 miles upstream to Palisade, Colorado, and in the lower 33 miles of the Gunnison River, a tributary to the mainstem Colorado River (Tyus et al. 1982).

Recent investigations in the San Juan River indicate successful Colorado squawfish spawning in the San Juan River above the confluence with the Mancos River, a distance of 143 miles above Lake Powell. Adult squawfish have been captured as far as 151.5 miles up the San Juan River (Personal communication, Miles Moretti, Utah Division of Wildlife Resources, 1988).

Biology

The life-history phases that appear to be most critical for the Colorado squawfish include spawning, egg fertilization, and development of larvae through the first year of life. These phases of Colorado squawfish development are tied closely to specific habitat requirements. Natural spawning of Colorado squawfish is initiated on the descending limb of the annual hydrograph as water temperatures approach 20° Celsius (C). Spawning, both in the hatchery and in the field, generally occurs in a 2-month time frame between July 1 and September 1, although high flow water years may suppress river temperatures and extend spawning in the natural system into September.

Temperature also has an effect on egg development and hatching. In the laboratory, egg mortality was 100 percent in a controlled test at 13°C. At 16 to 18°C, development of the egg is slightly retarded, but hatching success and survival of larvae was higher. At 20 to 26°C, development and survival through the larval stage was up to 59 percent (Hamman 1981). Juvenile temperature preference tests showed that preferred temperatures ranged from 21.9 to 27.6°C. The most preferred temperature for juveniles and adults was estimated to be 24.6°C. Temperatures near 24°C are also needed for optimal development and growth of young (Miller et al. 1982).

Areas of Impact and Concern

Only two Colorado squawfish confirmed spawning sites, as defined by the Upper Colorado River Coordinating Committee, have been located in the Upper Colorado River Basin: RM 16.5 of the Yampa River, and RM 156.6 of the Green River (U.S. Fish and Wildlife Service, 1987). Suspected spawning areas in the Green River are located below the confluence with the San Rafael river in Labyrinth

Canyon (RM99-115) and at Tusher Wash (RM124-129) (U.S. Fish and Wildlife Service 1987). These areas have the common characteristics of coarse cobble or boulder substrates forming rapids or riffles associated with deeper pools or eddies. It is believed that a stable, clean substrate is necessary for spawning. These substrates are swept clean of fine sediments by high flows prior to the spawning period and maintained clean throughout the spawning and incubation periods.

O'Brien (1984) studied the hydraulic and sediment transport dynamics on a cobble bar within the Yampa River spawning site and duplicated some of its characteristics in the laboratory. He concluded that the finer sediments, primarily sand, were flushed from the coarser cobbles down to a depth of one-half the cobble diameter below the cobble surface during peak flows. He reported a range in cobble size of 50-100 mm with an average 75 mm. O'Brien calculated that discharges on the order of one-half the incipient motion of the cobble bed were necessary to accomplish the observed effect at the study site.

Miller et al. (1982) concluded from collections of larvae and young-of-year below known spawning sites that there is a downstream drift of larval Colorado squawfish following hatching. Extensive studies in the Yampa and upper Green Rivers have demonstrated downstream distribution of young Colorado squawfish from known spawning areas (Archer et al. 1986, Haynes et al. 1985). Miller et al. (1982) also found that young-of-year Colorado squawfish, from late summer through fall, preferred natural backwater areas of zero velocity and less than 1.5 foot depth over silt substrate. Juvenile Colorado squawfish habitat preferences are similar to the young-of-year fish, but they appear to be more mobile and more tolerant to lotic conditions away from the sheltered backwater environment.

Very little information is available on the influence of turbidity on the endangered Colorado River fishes. It is assumed, however, that turbidity is important, particularly as it affects the interaction between introduced fishes and the endemic Colorado River fishes. Since these endemic fishes have evolved under natural conditions of high turbidity, it is concluded that the retention of these highly turbid conditions is an important factor for these endangered fishes. Reduction of turbidity may enable introduced species to gain a competitive edge which could further contribute to the decline of the endangered Colorado River fishes.

The Green River from Ruby Ranch (RM93) to Gunnison Butte (RM131) has been designated an adult Colorado squawfish concentration area based on electrofishing catch rates greater than 0.3 fish per hour. Migration routes traversed by radiotelemeters. Colorado squawfish within two months of the spawning season have been designated spawning migration routes, and include 354 miles of the Green River from its confluence with the Colorado River (RMO) to the gates of Lodore (RM364). As part of the Recovery Implementation Program, the following criteria were used to identify suspected Colorado squawfish spawning areas:

1. occurrence of deep pools interspersed with cobble/riffle habitat,

2. collection of ripe male Colorado squawfish with strippable milt or one or more radiotagged Colorado squawfish in the area during suspected spawning period,
3. occurrence of larval Colorado squawfish less than 25 mm in total length downstream of the spawning area.

Areas of the Green River below RM138 which are suspected spawning areas are Labyrinth Canyon (RM38 to 66 and 99 to 115) and Tusher Wash (RM124 to 129). Larval (less than 25 mm in total length) and young-of-the-year Colorado squawfish have been collected throughout the Green River in the past five years including the area from the confluence with the Price River (RM138) to the confluence with the Colorado River (RMO). From RMO to RM160 has been designated a high density young-of-the-year nursery area based on an average catch per effort greater than 0.9 per 10m² in ephemeral backwaters having near zero velocity and less than three feet deep. A high concentration area for juvenile Colorado squawfish (60 to 449 mm in total length based on an electrofishing rate exceeding 0.3 fish per hour has been designated from RM 0 to 131.

Thus, it is evident that the reach of the Green River below RM 138 provides habitat for all life stages of Colorado squawfish. The specific impacts of the depletion below RM138 are undetermined at this time, but the Service believes that reduced flows, particularly in June and July, may make the suspected spawning sites less suitable.

With implementation of the conservation measures given in this biological opinion by the Bureau, SCS, and Agriculture Stabilization and Conservation Service, the Fish and Wildlife Service has determined that the project will not jeopardize the continued existence of the Colorado Squawfish.

HUMPBACK CHUB

Humpback chub generally do not make migrational movements in the upper Colorado River and tend to reside throughout the year within a limited reach of river. Humpback chub are found inhabiting narrow, deep canyon areas, and are relatively restricted in distribution. They seldom leave their canyon habitat (Miller et al. 1982).

Humpback chub have been captured from the Colorado River in Black Rocks, Westwater, Cataract and Moab Canyons; from the Green River in Gray and Whirlpool Canyons; and from the Yampa River in Yampa Canyon. The only confirmed spawning area for humpback chub is Black Rocks Canyon. Suspected spawning areas are Westwater, Gray and Yampa Canyons (Archer et al. 1986).

The conservation measures included in this biological opinion for Colorado squawfish also will preclude jeopardy to the continued existence of the humpback chub.

BONYTAIL CHUB

Little is known about the biological requirements of the bonytail chub as the

species greatly declined in numbers in the upper Colorado River basin shortly after 1960. Until recently, the Service considered the species extirpated from the upper basin; however, a recently collected specimen which exhibits many bonytail characteristics could indicate a small, extant population. The bonytail chub evolved in the swift waters of the Colorado River system. The reasons for the decline of the bonytail chub in the upper Colorado River basin include the construction and operation of reservoirs. These create lower summer tailwater temperatures, loss of habitat in the reservoir basins, and reduction in flows below the dams. The decline of bonytail chub in the Green River below Flaming Gorge Dam was probably due to the alteration of yearly flow and water temperature patterns. These changes resulted in the elimination of bonytail chub in the Green River from Flaming Gorge Dam to the mouth of the Yampa River. The bonytail chub was common in the Green River below the mouth of the Yampa River after Flaming Gorge became operational in 1962.

The conservation measures included in this biological opinion for Colorado squawfish will also preclude jeopardy to the continued existence of the bonytail chub.

RAZORBACK SUCKER

Status

Historically, razorback sucker were abundant throughout the Colorado River Basin primarily in the mainstem and the major tributaries from Wyoming to Mexico. At present the only concentrations occur in the Green River in the upper basin and Lake Mohave in the lower basin. Fish in reproductive condition have been captured in the Yampa and San Juan rivers suggesting the importance of these river systems. Although reproduction in the wild has been documented, larvae seldom, if ever, survive past 20 mm. The lack of recruitment places this species in a precarious situation. Catch-effort estimates suggest that adult razorback suckers are rarer than other native suckers and the endangered Colorado squawfish. There is no formal recovery goal for razorback sucker, however, an immediate goal is to prevent their extinction in the wild.

Biology

Razorback suckers exhibit both local and long-distance spring and summer movements (Tyus and Karp 1990). Spawning of razorback suckers occurred during ascending and highest spring peak flows, as indicated by capture of ripe fish (Tyus and Karp 1989, 1990). Ripe fish have been captured at water temperatures averaging about 14-15°C (Tyus and Karp 1990). Bulkley and Pimentel (1983) reported that razorback suckers preferred temperatures of about 22-25°C and avoided temperatures of 8-15°C. Razorback sucker eggs taken in the Green River exhibited poor hatching at 11°C due to fungus, but hatching was successful (90%) when incubated at 20°C (FWS, unpublished data). Marsh (1985) noted optimal hatch in razorback sucker larvae incubated at 20°C.

The capture and artificial spawning of ripe razorback suckers in the lower Yampa and upper Green rivers (Severson et al. 1990) and the tentative

identification of larvae in upper Green River sine collections (R.T. Muth and D. Snyder, personal communications suggests that razorback suckers reproduce successfully in the upper Green River basin. Yet, there is little indication of recruitment to the juvenile stage throughout the Colorado River basin (Holden 1978; McAda and Wydoski 1980; Minckley 1983; Tyus 1987; Marsh and Minckley 1989; Tyus and Karp 1990). Standing crops of razorback suckers in the Green River are presumably old fish with no recruitment verified since the mid-1960's.

Habitat requirements of this species in riverine environments are not well known because of the scarcity of extant populations (Minckley 1983; Lanigan and Tyus 1989) and the absence of younger life history stages (Tyus 1987).

The Conservation measures included in this biological opinion for Colorado squawfish will also preclude jeopardy to the continued existence of the razorback sucker.

EFFECTS OF THE PROPOSED ACTION

Flow Analysis

The fact that the project depletes flows during peak runoff periods is of concern to the Service because this period is of great significance geomorphically and ecologically. This is the most dynamic period in the hydrologic cycle, and it precedes the very critical spawning period of the endangered fishes. Observations clearly demonstrate that the spawning activities of these fishes are synchronized with and are undoubtedly influenced by the runoff period (Archer et al. 1986; Archer and Tyus 1984). The Service believes that peak spring flows are very important for maintaining channel geomorphology, providing access to off-channel habitats, and preserving suitable spawning substrates.

Reductions in spring flows are of special concern in the Green River within the Price - San Rafael project area. Andrews (1986) described the Green River below the Duchesne River confluence as actively aggrading; the supply of sediment exceeded the ability of the river to transport it.

Table 6 summarizes current and anticipated depletions in the Green River Basin above the project area. To place this information in perspective, when all existing Green River depletions and depletions from proposed projects with a favorable biological opinion are added to private actions, total potential depletions accumulate to a little over 1.4 million acre-feet annually. Comparing this to the Green River flow at Green River, Utah, which has averaged around 4,648,000 acre feet over the past century, the depletions (real and potential) represent approximately 30 percent of the flow of the Green River.

Table 6. GREEN RIVER ENVIRONMENTAL BASELINE

Green River Above Flaming Gorge Reservoir	Depletion Amount Acre-Feet
Agriculture above Fontenelle	167,000
Agricultural use above Green River, Wyoming	20,000
Fish and Wildlife use at Seedskadee Refuge	6,000
Jim Bridger Power Plant and other thermal use	34,000
Present level minerals below Fontenelle Reservoir	34,000
Present level M & I uses below Fontenelle Reservoir	4,000
Naughton Thermal Plant	7,000
Agricultural use above Greendale, Wyoming	71,000
Layman project agricultural use	10,000
Other minerals above Greendale	6,000
Kemmerer Mine Mod.	107
Belina Mine Complex	5
Trail Mountain Mine	110
Wilberg Mine	69
Gorden Creek Mine #2	75
Church and Dwight Company	1,250
Eron Oil and Gas	30
Chevron	8
Pac. Enter. Oil	2
South Haystack Mine	96
Chevron Phosphate	10,200
Black Butte Mine	72
Upper Green River in Utah	
Agriculture between Greendale and Jensen	48,000
Jensen Unit	15,000
Moon Lake Power	22,089
Yampa River	
Yampa River Historic Agriculture	68,000
Hayden Power Plant	7,100
Craig Power Plant #1 & 2	5,600
Craig Power Plant #3	6,400
Private Actions Reasonably Certain to Occur	5,900
Yampa River Minerals	3,000
Stagecoach Reservoir	12,800
Seneca II Mine	4
Eckman Park Mine & Amendment	152
Edna Mine	28
Little Snake River	
Little Snake Historic Agriculture Wyoming	14,000

Cheyenne Stage I	8,000
Cheyenne Stage II	15,800 *
Little Snake Historic Agriculture Colorado	11,000
Duchesne River	
Bonneville CUP Exports	114,000 *
Agricultural use above Randlette Utah	293,000
Uinta Project	28,000
Bonneville Unit - Uinta Basin	22,000 *
Ute Indian Agriculture	4,000
Miscellaneous use above Ranolett	8,000
White River	
Colorado Agriculture	38,000
Colorado Municipal and Industrial	2,000
Kenny Reservoir	5,467 *
Utah Agriculture	4,000
Wolf Ridge Bicolite Mine #1 & 2	219 *
Andrikopolous Water Disposal	2 *
Meeker Area Mines	34 *
Colowyo Coal Company	127 *
Trapper Mine	123 *
Colorado Division of Wildlife Rio Blanco	200 *
White River Dam	80,500 *
Conslo Preference Right	400 *
James Creek	400 *
Chapman Riobold	35 *
Lower Green River	
Utah agricultural use above Green River	66,000
Miscellaneous use lower Green River	7,000
Price River exports	12,000
Price River Mine	43 *
Emery Power Plant #3	3,850 *
Trail Mountain Mine Expansion	72 *
South Haystack Mine	96 *
Paraho Ute Project	4,344 *
Cottonwood Creek Utah	2,041 *
Price River Mine Complex	43 *
San Rafael River	
Hunter Power Plant	18,000
Huntington Power Plant	12,000
Emery County Project	1,000
San Rafael Agriculture	61,000
San Rafael Minerals	2,000

Total Depletions above Green River Utah	1,401,893
Total Depletions Consulted Upon	412,831

* Denotes Projects With Completed Biological Opinions

CONSERVATION MEASURES

On January 21-22, 1988, the Secretary of the Interior, the Governors of Wyoming, Colorado, and Utah, and the Administrator of the Western Area Power Administration were co-signers of a Cooperative Agreement to implement the "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" (Recovery Program) (U.S. Fish and Wildlife Service, 1987). The Recovery Program applies to the Upper Colorado River Basin above Glen Canyon Dam, excluding the San Juan River Basin. An objective of the Recovery Program is to identify reasonable and prudent alternatives that would ensure the survival and recovery of the listed species while providing for new water development in the Upper Colorado River Basin. To achieve this objective, the Recovery Program consists of five elements or program areas, including:

- (a) habitat management (provision of stream flows);
- (b) habitat development and maintenance;
- (c) stocking of native fish species
- (d) non-native species and sport fishing management; and
- (e) research monitoring and data management

The Recovery Program states that "full implementation of all these elements will form the basis for the 15 year recovery program. . . . It is not expected that the success of the program will be solely dependent upon any one of these elements, but on the successful interrelationships between all elements."

The following excerpts are pertinent to the consultation because they summarize portions of the Recovery Program that address depletion impacts, Section 7 consultation, and project proponent responsibilities:

"All future Section 7 consultations completed after approval and implementation of this program (establishment of the Implementation Committee, provision of congressional funding, and initiation of the elements) will result in a one-time contribution to be paid to the Service by water project proponents in the amount of \$10 per acre-foot based on the average annual depletion of the project This figure will be adjusted annually for inflation Concurrently with the completion of the Federal action which initiated the consultation, e.g., . . . issuance of a 404 permit, 10 percent of the total contribution will be provided. The balance . . . will be . . . due at the time the construction commences Funds from these contributions will be applied equally to flow acquisition and to other recovery activities. . . . "

(Pg. 5-4)

It is important to note that these provisions of the Recovery Program were based on numerous underlying assumptions which are described on pages 4-5 and 4-6 of the Recovery Program. The Recovery Program states:

"4.1.5 Section 7 Consultation

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The mechanism described in the preceding sections is intended to provide the means to protect and manage the stream habitat of the endangered fishes by offsetting some of the factors that led to the present status of these fish. Success of this part of the recovery program is based upon numerous underlying assumptions, as follows:

- a. rapid determination of flow needs;
- b. Sufficient funds to purchase water rights;
- c. availability of water rights;
- d. protection of instream flows;
- e. provision of flows by Reclamation projects; and
- f. continued participation and support by all parties.

Effective and continued progress will be dependent upon whether these assumptions are being met through periodic assessment by each party." (Pgs. 4-5 and 4-6)

The Recovery Program further states:

" Since this program sets in place a mechanism and a commitment to assure that the instream flows are protected under State law, the Service will consider these elements under Section 7 consultation as offsetting project depletion impacts." (Pg. 4-6).

Thus, the Service has determined that project depletion impacts, which the Service has consistently maintained are likely to jeopardize the listed fishes, can be offset by (a) program activities partially funded by the water project proponents one-time financial contribution to the Recovery Program, (b) appropriate local protection of instream flows pursuant to State law, and (c) progress in other recovery elements which results in protection of habitat or enhancement of the natural populations of the listed species. The Service believes it is essential that protection of instream flows proceed expeditiously, before significant water depletions occur.

The Price - San Rafael Salinity Control Project is a cooperative effort among the Bureau, USDA agencies and private land owners. The Bureau has agreed to contribute \$1.5 million annually to the Recovery Program. Because of this ongoing contribution and the commitment by the Upper Colorado River Region of the Bureau to provide instream flows for the endangered fishes as identified in the Recovery Program, no contribution for existing or future Bureau projects will be required as part of the Section 7 consultation process. As a result, no contribution is necessary for the Bureau caused 2,850 acre-foot depletion resulting from the Price-San Rafael salinity control project.

The USDA agencies have maintained that they can not be responsible for paying the depletion allowance. However they have agreed not to sign contracts with landowners until they have agreed to be responsible parties and have paid the applicable depletion allowance (see attachment) or an equitable mechanism is provided to address this requirement. Depletions

greater than 3,000 acre-feet per year are considered by the Service to be large depletions requiring additional considerations. In order for the contribution of \$11.50 per acre-foot to offset the jeopardy situation resulting from the depletion, it is essential that sufficient progress be made toward acquiring water and legally protecting instream flows before the depletions actually occur.

With respect to (a) above (i.e., the financial contribution), the project will need to provide a one-time payment which will be calculated by multiplying the onfarm average annual depletion (22,460 AF) times the depletion charge in effect at the time payment is made. For fiscal year 1992 (October 1, 1991 to September 30, 1992), the depletion charge will be \$11.50 per acre-foot of the average annual depletion which equates to a total payment of \$258,290. This amount will be adjusted annually for inflation on October 1 of each year based on the previous year's composite Consumer Price Index. The Service will notify the USDA agencies/responsible parties of any change in the depletion charge by September 1 of each year. Ten percent of the total contribution (\$25,829) will be provided to the National Fish and Wildlife Foundation at the time of Congressional project authorization. The balance will be due at the time construction commences. Fifty percent of the funds will be used for acquisition of water rights to meet the instream flow needs of the endangered fishes (unless recommended otherwise by the Implementation Committee); the balance will be used to support other recovery activities for the Colorado River endangered fishes. Payment should be made to the National Fish and Wildlife Foundation, Bender Building, 1120 Connecticut Ave. N.W., Washington, D.C. 20236 (Appendix A).

The Service is currently in consultation with the Bureau on the operation of Flaming Gorge dam. Flows likely to be prescribed by that biological opinion will represent a significant effort in the habitat management element of the Recovery Program. Legal protection of these prescribed flows are an essential part of progress in the recovery program and therefore should be pursued by all parties involved. In the event that sufficient progress under the Recovery Program, as determined by the Service and the Recovery Team, has not occurred by the time USDA construction funds are appropriated, additional measures may be required to offset the effects of this depletion. Such measures could include acquisition of water, protection of instream flows, habitat improvement/enhancement, or other measures unique to this project which would go beyond the relatively simple payment of a depletion charge. Reinitiation of consultation would be required to discuss additional conservation measures in the event "sufficient progress" has not been achieved under the Recovery Program. Project proponents should be aware of and agree to this possible eventuality.

With respect to item (c), above, the Service evaluated progress under the Recovery Program (Appendix B). This evaluation considered (a) progress in all areas of instream flow protection (including the good faith effort by participants in the Recovery Program), (b) progress in other recovery elements, and (c) the magnitude of impacts of the Price - San Rafael project on the endangered fishes. The Service gave consideration to progress in the drainage where project impacts occur as well as progress in other parts of the basin.

Based on its evaluation, the Service has determined that progress under the Recovery Program has not been sufficient at this time to offset the depletion impacts of the Price - San Rafael project. To date, the water rights acquired under the Recovery Program are not sufficient to offset the project depletions and there is significant uncertainty that progress will in fact lead to protection of Green River instream flows in a timely manner. Furthermore, progress in other recovery elements has yet to result in substantive protection of habitat or enhancement of the populations of the listed species. Therefore, if progress has not been made, by the time USDA construction funds are appropriated for the project, Section 7 Consultation must be reinitiated, and additional conservation measures may be required.

INCIDENTAL TAKE

Section 9 of the Endangered Species Act, as amended, prohibits any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Under the terms of Section 7(b)(4), taking that is incidental to and not intended as part of the agency action is not considered taking within the bounds of the Act provided that such taking is in compliance with the incidental take statement.

The USDA agencies have agreed that contributions to the Recovery Program will be available or they will not implement the construction program as specified in this biological opinion. This money will be used to assist in the recovery of the Colorado River endangered fish. With receipt of the monetary contribution and the assurance that additional measures will be required if sufficient progress is not made, the Service does not anticipate that the proposed action will result in any incidental take of Colorado squawfish, humpback chub, razorback sucker or bonytail chub. Accordingly, no incidental take is authorized. Should any take occur, the Bureau must reinitiate formal consultation with the Service and provide the circumstances surrounding the take.

CONCLUSION

This concludes our biological opinion on the construction of the Price-San Rafael Rivers Salinity Control Unit. This opinion was based upon the information described herein. If new information becomes available, new species are listed, there is any change in the average annual depletion, operations described in the biological assessment change significantly and which may affect any threatened or endangered species in a manner or to an extent not considered in this biological opinion, or depletion charges not paid or additional required measures not effected, formal Section 7 consultation should be reinitiated.

Reed E. Harris

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ATTACHMENT IV

Cultural Resources Consultation



State of Utah

Division of State History
(Utah State Historical Society)
Department of Community and Economic Development

Norman H. Bangerter

Governor

300 Rio Grande

Max D. Evans

Salt Lake City, Utah 84101

801-533-4255

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April 3, 1990

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Mr. Roland Robison
Regional Director
Bureau of Reclamation
Upper Colorado Regional Office
P. O. Box 11568
Salt Lake City, UT 84147

RE: UC-155A, Colorado River Water Quality Improvement Program: Price-San Rafael Rivers Unit, Draft Programmatic Agreement (Cultural Resources)

In Reply Please Refer to Case No. 90-0418

Dear Mr. Robison:

The Utah State Historic Preservation Office received the above referenced report on March 27, 1990. After review of the draft programmatic agreement for the Price-San Rafael Rivers Unit, our office would sign the agreement as written. Our office also has no technical comments to make about the the draft.

This information is provided on request to assist the Bureau of Reclamation with its Section 106 responsibilities as specified in 36 CFR 800. If you have questions or need additional assistance, please contact me at (801) 533-7039.

Sincerely

James L. Dykman
Regulation Assistance Coordinator

JLD:90-0418/8691V BuofRec

ATTACHMENT V

Environmental Commitments and Compliance

ENVIRONMENTAL COMMITMENTS

Reclamation.—The following list summarizes major environmental commitments for the Price-San Rafael Unit. These commitments would be included in construction contracts and other agreements to ensure their implementation.

1. Appropriate fencing would be provided under the following guidelines.

Canals that are used as barriers for livestock would be fenced if the canal is to be dewatered during the winter. Safety fences would be constructed on either side of open, concrete-lined laterals or canals according to the Reclamation Design Standards contained in Revised Safety Standards No. 1, as follows:

- Class A - Adjacent to schools and recreational areas such as playgrounds and areas frequently visited by children.
- Class B - Nearby or adjacent to urban areas or highways and frequently visited by the public. Urban areas are those where 25 percent or more of the property ownership is 2 acres or less.
- Class C - Nearby or adjacent to farms or highways which could be visited by children seeking recreation.
- Class D - Far removed from any dwelling and infrequently visited by operations personnel and occasional hunters.
- Class E - That would be hazardous to domestic animals.
- Class F - That would be extremely hazardous to big game animals.

Three types of fencing would be used:

School Safety Fence.—This fence would be 7 feet high with 6 feet of chain link fabric and three strands of barbed wire supported by steel posts at 10-foot centers with a toprail.

Urban Safety Fence.—This fence would be 5 feet high with 4 feet of chain link fabric and three strands of barbed wire supported by steel posts at 10-foot centers with a toprail.

Rural Safety Fence.—This fence would be 5 feet high with 47 inches of woven wire and two strands of barbed wire supported by either steel or wooden posts. Steel posts would be placed at 12-foot centers and wooden posts at 16-foot centers.

Lateral or canal fencing would be provided based upon depth and water velocity following these guidelines:

- a. All laterals and canals in Class A areas would have school safety fence regardless of water depth or velocity.
- b. Laterals outside Class A areas with a water depth of less than 24 inches would not be fenced.
- c. In Class B and C areas, laterals with a water depth between 24 and 36 inches and water velocity in excess of 10 feet per second would be fenced. Velocities in this range are generally avoided but could be reached in some drop structures.
- d. Laterals in residential areas having a water depth between 24 and 36 inches would be fenced with urban safety fence. Residential areas are those where 25 percent or more of the property ownership is 1 acre or less.
- e. Laterals in Classes D, E, and F areas with a water depth less than 36 inches would not be fenced.

Canal fencing would then be provided for the above classes as follows:

1. Both sides of the improved canal would be fenced. A barbed-wire stock fence would be placed on the north side of the canal and the cross-drainage ditch. A wire-mesh fence would be placed south of the canal.
2. Siphon inlets would be protected by 7-foot chain link safety fences. Nets, cables, and safety ladders which are removed during construction would be replaced at the request of the landowner.
3. All existing fencing on the laterals which are removed during construction would be replaced at the request of the landowner.
4. All upland sites used for borrow and disposal sites, work areas, or sites that are otherwise disturbed during off-farm construction would be restored following construction. Topsoil in the construction material sites and access road areas would be stockpiled and respread to allow revegetation when the sites are closed. The sites would be shaped so their contours would conform to the appearance of adjacent, undisturbed areas. The surface of sites would be scarified across slopes to impede sheet

runoff and to reduce erosion. Construction material sites would be reseeded with a mixture of native plants compatible to adjacent areas. If any construction material sites are located on public lands, they would be reclaimed according to Bureau of Land Management standards. It is estimated that disturbed and subsequently reclaimed acres would not exceed 457 acres.

5. All damages within rights-of-way boundaries would be paid by Reclamation, and damages caused by construction activity that falls outside boundaries would be paid for by the contractor. Payments by Reclamation would be determined by a Reclamation appraisal or mutual agreement.
6. Payments for crop damages during construction would be made directly to the affected landowner.
7. Contracts for lateral operation and maintenance would be written to ensure that the maximum salinity reduction would occur.
8. All permits necessary for construction on or for use of public lands would be acquired.
9. Disturbances to existing utilities and watercourses would be minimized.
10. Roadways across canals and laterals would remain passable during construction.
11. No soil material would be disposed of in wetland areas.
12. Sites that are listed on or are eligible for nomination to the National Register of Historic Places either would not be affected by the proposed project, or damages to them would be mitigated before construction.
13. Although it is unlikely that threatened or endangered plants occur in the proposed project area, certain precautionary measures would be taken. Precautions include close coordination with the U.S. Fish and Wildlife Service in Salt Lake City and onsite inspections of all areas that would be disturbed by off-farm construction activities. Under the Soil Conservation Service program, an environmental evaluation would be completed on each farm during the planning process and before any new construction. No construction activities would occur in any area where a listed plant was found until suitable conservation measures were developed and implemented.

14. Potential habitat for the black-footed ferret would be surveyed within 12 months of disturbance by construction, according to the U.S. Fish and Wildlife Service guidelines.
15. In addition to these commitments made in this environmental impact statement, all construction and operation contracts would include the following general requirements:
 - a. Work would be performed to minimize any impact to air quality which may be caused by fumes, odors, and smoke; dust; burning; and pesticides and herbicide use.
 - b. Water quality would not be affected by erosion, wastewater disposal (construction or sanitary), and accidental spills of petroleum products and other chemicals.
 - c. Noise would be controlled by adequate muffling and scheduling to avoid conflict.
 - d. Postconstruction cleanup would leave all work areas orderly and adequately restored to an acceptable condition.
16. Reclamation would purchase from willing sellers up to 380 acres, with water rights, to be used for development of wetlands lost from off-farm activities. Reclamation would seek input from the Utah Division of Wildlife Resources, but would maintain the lead responsibilities for acquisition and design and development of wetlands. Wetlands would be developed in a ratio corresponding to their losses.
17. Golden eagles, their parts, nests, and eggs are protected under the Bald Eagle Protection Act (the Act) of 1940 (16 U.S.C. 688 et seq.). Disturbances are considered a form of take and are prohibited by the Act. All disturbances to the golden eagle nest on Rasmussen Canal would be avoided between February and July when nesting activities are underway. If the cottonwood tree supporting the nest prevented canal lining, Reclamation would apply to the Service's Special Agent in Charge for a permit to relocate the nest or nest site.

Phillips and Beske (1983) describe two relocation procedures that have proven successful for moving eagle nests. The first procedure involves removing the nest during the non-nesting season (August-January), and securing it to a new substrate. The original site (cottonwood tree) would then be removed. The second procedure would involve construction of a platform nest site and the relocation of nestlings at 4-6 weeks of age.

The selection of an appropriate procedure would occur in consultation with the Service.

The U.S. Department of Agriculture (USDA) believes that voluntary habitat replacement within the Colorado River Basin Salinity Control Program will be successful in replacing wildlife values foregone within the Price-San Rafael Rivers Unit. However, if monitoring indicates trends of lost wildlife habitat values, USDA will seek additional funding authority to assure replacement of these values.

If, after 5 years, monitoring indicates a trend of lost wildlife habitat values, USDA will seek additional funding authority to assure replacement of these values. This authority might include offering cost sharing for replacement of wetland outside of the Price and San Rafael basins. This action would require a change in USDA Colorado River Salinity Control interim rules.

SCS.—Planning for salinity control measures would occur on a farm-by-farm basis as landowners applied for program assistance. An environmental evaluation would be completed on each farm during the planning process and before any new construction. The purpose of the evaluation is to document all significant impacts to resources, including threatened and endangered species. No construction activities would occur in any area where a listed threatened or endangered plant is located until suitable conservation measures were developed and implemented.

Implementation will not be initiated until the depletion charge for decrease in streamflow is paid to conform with the Recovery Implementation Plan.

Both Agencies.—Both SCS and Reclamation have followed other mandates for environmental preservation, including those of Executive Order 11990, Protection of Wetlands; the 404 permitting process under the Clean Water Act; and Section 303 of that Act.

Executive Order 11990.—The agencies advocate the retention of wetlands and seek to ensure that such lands are not irreversibly converted to other uses, unless other national interests override the importance of preservation or otherwise outweigh the environmental benefits derived from their protection.¹

Reclamation routinely coordinated with the Service on issues concerning wetlands and emphasizes habitat replacement in-kind.

SCS was aware of the conflict between the competing environmental values of water quality and irrigation-induced wetlands when it developed its wetland policy (7 CFR 650.26) in compliance with Executive Order 11990. SCS wetland policy was written to allow for certain policy exceptions, if necessary, to meet identified irrigation water management (water quality and

¹ (SCS Rules for Compliance with the National Environmental Policy Act, 7 CFR Part 650, Section 650.3(b)(9); *Federal Register*, Volume 44, No. 169, August 29, 1979, page 580).

water conservation) objectives. SCS would coordinate with the Service and UDWR when wetland changes were anticipated. SCS would make every effort to encourage participants to include wetland preservation and/or replacement practices in their salinity control plans.

404 Permit Process, Clean Water Act.—The Army Corps of Engineers (Corps) has recognized an exemption determination for irrigation-induced wetlands:

"Where the proposed work would involve a discharge of dredged or fill material into upland irrigation systems or wetlands which have been created by past irrigation practices, the work would be exempted from regulation under Section 404 of the Clean Water Act" (33 USC 1344).

A letter dated May 24, 1991, from the Utah Regulatory Office of the Corps to the SCS stated:

"The Corps does not exert regulatory jurisdiction over wetlands created by the direct application of water for the production of crops...it is sometimes difficult to differentiate between artificially created and artificially enhanced wetlands. For this, we rely on the expertise of your agency personnel for difficult calls...the Sacramento District of the Corps does regulate wetlands created by the leakage of water from irrigation canals and pipes...when these areas develop wetland characteristics."

Section 303, Clean Water Act.—The joint agency plan for the Price-San Rafael Rivers Unit would meet the objective of this section, which directs the Environmental Protection Agency to "develop comprehensive programs for preventing, reducing, or eliminating the pollution of navigable waters and ground waters."

The proposed plan for the Price-San Rafael Rivers Unit would meet antipollution requirements of the Clean Water Act, which defines "pollution" to mean the manmade or man-induced alteration of the chemical, physical, biological, and radiological integrity of water. The plan would reduce salt pollution by reducing salt-laden return flows, and would, accordingly, restore and maintain water quality as derived by EPA from the Act. The Clean Water Act's policies and regulations require that all existing instream beneficial uses be maintained and protected.

Food Security Act of 1985 (FSA).—The FSA of 1985 (Public Law 99-198) grants exemption status to artificial wetlands (irrigation-induced wetlands). Title XI, Subtitle C, Section 1222 of Public Law 99-198 provides that a producer cannot be ruled ineligible for USDA program benefits because of production of an agricultural commodity on wetland or converted wetland if the land was a wetland created by seepage from an irrigation delivery system or the application of water for irrigation.

ATTACHMENT VI

Economics

ECONOMICS

Methodology for Computing the Value of Salinity Reduction

The value of salinity reduction for evaluating downstream benefits in the preparation of the Price-San Rafael plan was based on Alan Kleinman's and Bruce Brown's "Colorado Salinity - Economic Impacts on Agricultural, Municipal, and Industrial Users," published December 1980, by the Bureau of Reclamation. The 1980 figures were updated to 1989 levels using the 1989 Gross National Product Implicit Price Deflator Index. The 1989 value, thus derived, is \$68.44 per ton of salt reduction above Parker Dam, Arizona.

Operating under the *Principles and Guidelines*, the Soil Conservation Service (SCS) has used only the direct portion of these benefits for project evaluation purposes; i.e., \$51.33 per ton. Reclamation also indexed the 1976 figures to a 1989 value to derive a direct benefit value of \$51.33 per ton.

In recent years, Reclamation has evaluated the technical adequacy of an updated salinity benefit model. Preliminary results show that direct salinity benefits may be as high as \$295 per ton by year 2010, expressed in 1989 dollars. This per unit value assumes that the salinity control program is fully implemented by year 2010. Reclamation has adopted the new value on an interim basis, in lieu of the above value from the Kleinman and Brown model, pending further review. However, SCS has not reviewed the model in sufficient detail to accept the value for use in project justification. Therefore, the updated salinity value is not displayed in table IV-6. It should be recognized, however, that benefits may be significantly understated.

Regional Economic Development Account, SCS
(Annual monetary impacts in \$1,000's)¹
Onfarm irrigation improvements

Income category	NED plan		RP plan	
	Impacts (in \$1,000)			
	State of Utah	Rest of Nation	State of Utah	Rest of Nation
Beneficial effects				
1. Onfarm benefits	\$1,756		\$2,032	
2. Downstream benefits		4,956		5,581
Total beneficial effects	1,756	4,956	2,032	5,581
Adverse effects²				
1. Project installation ³	399	930	783	1,826
2. OM&R	624	0	869	0
3. Monitoring	0	118	0	118
4. Technical assistance	0	220	0	432
5. Replacement of wetland values	45	105	62	145
6. Depletion	18	0	21	0
7. Project administration	10	189	19	372
8. Education	0	35	0	35
Total adverse effects	1,099	1,597	1,754	2,928
Net beneficial effects	657	3,359	278	2,653

¹ Values in 1989 dollars.

² Cost amortized at 8-7/8 percent for 50 years.

³ Based on 70-percent cost share.

Reclamation RED account winter water
plan and off-farm irrigation improvement
(annual monetary impacts in \$1,000)¹

	Impacts (in \$1,000) ²			
	Region	Adjacent region ³	Rest of Nation ⁴	NED
Beneficial				
Value to user				
Direct	\$ 0	\$2,095	0	\$2,095
External economies	0	0	0	0
Unemployed resources	31	0	0	31
Increases from plan services	0	0	0	0
Construction benefits ⁵	1,424	0	-1,424	0
Incremental OMR&E ⁶ salaries	0	0	0	0
Contractor's purchases	337	0	-337	0
Total beneficial effects	\$1,792	\$2,095	-\$1,761	\$2,126
Adverse				
User payments--basin funds ⁷				
Investment costs		-928	0	-928
OMR&E	0	0	0	0
Nonreimbursed by Upper and Lower Colorado basin funds				
Investment costs	0	0	-2,167	-\$2,167
OMR&E	0	0	0	0
External diseconomies				
Displaced resources	0	0	0	0
Loss in welfare payments	-3	0	3	0
Total adverse effects	\$ -3	-\$ 928	-\$2,164	-\$ 995
Net beneficial effects	\$1,789	\$1,167	-\$3,925	-\$ 969

¹ Reclamation and SCS RED accounts are not the same.

² Annual values in 1989 dollars.

³ Adjacent region refers to users of the Colorado River downstream from the region of impact.

⁴ Rest of Nation refers to the rest of the State of Utah and all other States of the United States.

⁵ Includes direct construction salaries plus gross output multiplier effect (indirect earnings).

⁶ Operation, maintenance, replacement, and energy.

⁷ Fiscal year 1990 repayment interest rate for the Colorado River Basin Salinity Control Act is 8-1/8 percent, 50-year repayment period. Thirty percent is reimbursable from the Upper and Lower Colorado River Basin Funds (Public Law 98-569).

Construction cost estimate

Project - Colorado River Water Quality Improvement		By - REM			
Division -		Date - December 1989			
Unit - Price-San Rafael Rivers		Type - Appraisal			
Feature - RP Plan - Off-farm Portion		Level - January 1988			
Item	Description	Quantity	Unit	Price	Amount
	Price - San Rafael				
	Total Reclamation Project Cost				
	RP Plan				35,362,300
	Irrigation improvement increment				30,183,300
1	(1) Carbon Canal System	7,600	Acre	607	4,610,000
2	Off-farm piped laterals	Lump sum	LS	459,000	461,000
	Off-farm unlisted (10%)				
	Contract cost				5,070,000
	Contingency (piped laterals - 20%)				1,010,000
	Field cost				6,080,000
	Administrative cost (33%)				2,010,000
	Reclamation construction cost				8,090,000
3	Off-farm mitigation				122,373
	Reclamation project cost for subunit				8,212,400
1	(2) Cottonwood Canal System	4,760	Acre	649	3,090,000
2	Off-farm piped laterals	Lump sum	LS	309,000	309,000
	Off-farm unlisted (10%)				
	Contract cost				3,400,000
	Contingency (piped laterals - 20%)				680,000
	Field cost				4,080,000
	Administrative cost (33%)				1,350,000
	Reclamation construction cost				5,430,000
3	Off-farm mitigation				170,000
	Reclamation project cost for subunit				5,600,000
1	(3) Ferron Canal System	5,050	Acre	741	3,740,000
2	Off-farm piped laterals	Lump sum	LS	374,000	374,000
	Off-farm unlisted (10%)				
	Contract cost				4,110,000
	Contingency (piped laterals - 20%)				823,000
	Field cost				4,930,000
	Administrative cost - (33%)				1,630,000
	Reclamation construction cost				6,560,000
3	Off-farm mitigation				185,300
	Reclamation project cost for subunit				6,743,300

Construction cost estimate (continued)

Sheet 2 of 4

Item	Description	Quantity	Unit	Price	Amount
Project - Colorado River Water Quality Improvement					
Division -					
Unit - Price-San Rafael Rivers					
Feature - RP Plan - Off-Farm Portion					
By - REM					
Date - December 1989					
Type - Appraisal					
Level - January 1988					
1	(4) Huntington-Cleveland Canal Systems				
2	Off-farm pipe laterals	4,815	Acre	602	2,900,000
	Off-farm unlisted (10%)	Lump sum	LS	289,000	290,000
	Contract cost				3,190,000
	Contingency (piped laterals - 20%)				640,000
	Field cost				3,830,000
	Administrative cost (33%)				1,260,000
3	Reclamation construction cost				5,090,000
	Off-farm mitigation				315,767
	Reclamation project cost for subunit				5,405,800
1	(5) Moore Canal System				
2	Off-farm piped laterals	560	Acre	643	360,000
	Off-farm unlisted (10%)	Lump sum	LS	36,000	36,000
	Contract cost				396,000
	Contingency (piped laterals - 20%)				79,200
	Field cost				475,000
	Administrative cost (33%)				157,000
3	Reclamation construction cost				632,000
	Off-farm mitigation				45,400
	Reclamation project cost for subunit				677,400
1	(6) Price-Wellington Canal System				
2	Off-farm piped laterals	3,215	Acre	610	1,960,000
	Off-farm unlisted (10%)	Lump sum	LS	196,000	196,000
	Contract cost				2,160,000
	Contingency (piped laterals - 20%)				431,000
	Field cost				2,590,000
	Administrative cost (33%)				854,000
3	Reclamation construction cost				3,444,000
	Off-farm mitigation				98,400
	Reclamation project cost for subunit				3,542,400

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Construction cost estimate (continued)

Sheet 3 of 4

Project - Colorado River Water Quality Improvement					
Division -					
Unit - Price-San Rafael Rivers					
Feature - RP Plan - Off-farm Portion					
By - REM					
Date - December 1989					
Type - Appraisal					
Level - January 1988					
Item	Description	Quantity	Unit	Price	Amount
	Winter water increment				5,179,000
	(1) Cottonwood Creek M&I Line				
	Waterways				
	Winter water lines				
1	4-inch class 125	4,800	LNF	6.63	31,824
2	4-inch class 275	1,800	LNF	6.63	11,934
3	6-inch class 250	2,665	LNF	9.19	24,491
4	10-inch class 200	2,720	LNF	14.83	40,338
5	10-inch class 300	2,980	LNF	15.33	45,683
6	12-inch class 300	1,000	LNF	19.08	19,080
7	12-inch class 325	4,620	LNF	19.08	88,150
8	Stream crossing	1	LS	2,600	2,600
9	Highway crossing	1	LS	2,600	2,600
	Valves				
10	12-inch butterfly	1	EACH	1,110	1,110
11	Air valves	4	EACH	156	624
12	Mobilization (4%)	Lump sum	LS	10,737	10,737
13	Unlisted (10%)	Lump sum	LS	27,917	27,917
	Water treatment plant line				
15	3-inch class 200	2,920	LNF	12.12	35,379
16	3-inch class 250	800	LNF	12.12	9,693
17	10-inch class 175	1,300	LNF	14.83	19,227
18	10-inch class 200	1,850	LNF	14.83	27,878
19	15-inch class 275	4,200	LNF	23.94	100,541
20	18-inch class 50	4,645	LNF	29.32	136,207
21	18-inch class 75	1,000	LNF	29.32	29,323
22	18-inch class 100	2,000	LNF	29.32	58,647
23	18-inch class 125	1,000	LNF	29.32	29,323
24	18-inch class 150	2,000	LNF	29.32	58,647
25	18-inch class 175	2,000	LNF	29.32	58,647
26	18-inch class 200	2,000	LNF	29.32	58,647
27	18-inch class 225	3,000	LNF	31.35	94,043
28	18-inch class 250	2,000	LNF	31.35	62,695
29	21-inch class 25	4,000	LNF	37.02	148,064
30	21-inch class 50	355	LNF	38.03	13,500
31	Stream crossing - Cottonwood Creek	1	EACH	2,600	2,600
32	Highway crossing	1	EACH	2,600	2,600
	Valves				
33	12-inch butterfly	1	EACH	1,110	1,110
34	6-inch butterfly	1	EACH	655	655
35	Air valves	5	EACH	156	780
36	Mobilization - (4%)				37,930
37	Unlisted (10%)				98,619
	Contract cost				1,390,000
	Contingency (piped laterals - 20%)				278,000
	Field cost				1,670,000
	Administrative cost (33%)				551,000
	Reclamation construction cost				2,221,000

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Construction cost estimate (continued)

Sheet 4 of 4

Project - Colorado River Water Quality Improvement	By - REM
Division -	Date - December 1989
Unit - Price-San Rafael Rivers	Type - Appraisal
Feature - RP Plan - Off-farm Portion	Level - January 1988

Item	Description	Quantity	Unit	Price	Amount
	(2) Culinary Delivery Lines				
	NEWUA System - 163 connections				
1	Connection fee	163	EACH	1,250	203,750
2	Water meter	163	EACH	260	42,380
3	3/4-inch PVC pipe	81,500	LNF	1.01	82,494
4	Mirafount livestock waterer - No. 3360	163	EACH	395	64,385
5	Shipping waterer to Utah	163	EACH	14	2,282
6	Concrete base	163	EACH	40	6,520
7	Installation	163	EACH	35	5,705
8	Unlisted (10%)	Lump sum	LS	40,752	40,752
	PRWID System - 50 connections				
1	Connection fee	50	EACH	550	27,500
2	Water meter	50	EACH	260	13,000
3	3/4-inch PVC pipe	25,000	LNF	1.01	25,305
4	Mirafount Livestock Waterer - No. 3360	50	EACH	395	19,750
5	Shipping waterer to Utah	50	EACH	14	700
6	Concrete base	50	EACH	40	2,000
7	Installation	50	EACH	35	1,750
8	Unlisted (10%)	Lump sum	LS	9,000	9,000
	Contract cost				547,000
	Contingency (piped laterals - 20%)				109,000
	Field cost				656,000
	Administrative cost (33%)				217,000
	Reclamation construction cost				873,000
	(3) Stock Water Ponds				
1	Excavation	131,140	SY	4.00	524,560
2	Earth cover	44,405	SY	1.00	44,405
3	20-mil PVC liner	153,197	SY	1.00	153,197
4	Fence	58,100	LNF	3.00	174,300
5	Gate	83	EACH	100	8,300
6	2-inch PVC pipe	16,600	LNF	6.25	103,750
7	Inlet screen	83	EACH	40	3,320
8	Mirafount livestock waterer - No. 3360	83	EACH	395	32,785
9	Shipping waterer to Utah	83	EACH	14	1,162
10	Concrete Base	83	EACH	40	3,320
11	Installation	83	EACH	35	2,905
12	Unlisted (10%)	Lump sum	LS	105,200	105,200
	Contract cost				1,160,000
	Contingency (piped laterals - 20%)				232,000
	Field cost				1,390,000
	Administrative cost (33%)				459,000
	Reclamation construction cost				1,849,000
	(4) Winter Water Mitigation Cost				236,000

Preconstruction
and other work Construction

CONTROL SCHEDULE

L I N E	PROGRAM ITEM	QUANTITY	ESTIMATED TOTAL	PRECONSTRUCTION												BALANCE TO COMPLETE	L I N E																							
				1ST YEAR				2ND YEAR				3RD YEAR						4TH YEAR				5TH YEAR				6TH YEAR				7TH YEAR				8TH YEAR						
				1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q					
2	PROGRAM GOAL																																							
3	Salinity Reduction, Colorado River At Imperial Dam - Tons	7,940																																						
5	RECLAMATION CONSTRUCTION PROGRAM																																							
6	Irrigation Improvement Increment																																							
7	Carbon Subarea																																							
8	Off-Farm Piped Laterals	To Treat 7600	\$8,090,000	\$486,400				\$381,000				\$802,600				\$802,500				\$802,500				\$802,500				\$802,500				\$802,500								
9	Off-Farm Mitigation	Acres	\$122,400													\$61,200				\$8,740				\$8,740				\$8,740				\$8,740								
10	Cottonwood Subarea																																							
11	Off-Farm Piped Laterals	To Treat 4760	\$5,430,000	\$326,400				\$256,000				\$538,800				\$538,600				\$538,600				\$538,600				\$538,600				\$538,600								
12	Off-Farm Mitigation	Acres	\$170,000													\$85,000				\$12,100				\$12,100				\$12,100				\$12,100								
13	Ferron Subarea																																							
14	Off-Farm Piped Laterals	To Treat 5050	\$6,560,000	\$394,400				\$308,900				\$651,100				\$650,700				\$650,700				\$650,700				\$650,700				\$650,700								
15	Off-Farm Mitigation	Acres	\$185,300													\$92,600				\$13,200				\$13,200				\$13,200				\$13,200								
16	Huntington-Cleveland Subarea																																							
17	Off-Farm Piped Laterals	To Treat 4815	\$5,090,000	\$306,400				\$238,300				\$505,300				\$505,000				\$505,000				\$505,000				\$505,000				\$505,000								
18	Off-Farm Mitigation	Acres	\$315,800													\$157,900				\$22,600				\$22,600				\$22,600				\$22,600								
19	Moore Subarea																																							
20	Off-Farm Piped Laterals	To Treat 560	\$632,000	\$38,000				\$29,700				\$62,700				\$62,700				\$62,700				\$62,700				\$62,700				\$62,700								
21	Off-Farm Mitigation	Acres	\$45,400													\$22,700				\$3,240				\$3,240				\$3,240				\$3,240								
22	Price-Wellington Subarea																																							
23	Off-Farm Piped Laterals	To Treat 3215	\$3,444,000	\$207,200				\$161,700				\$341,500				\$341,700				\$341,700				\$341,700				\$341,700				\$341,700								
24	Off-Farm Mitigation	Acres	\$98,400													\$49,200				\$7,030				\$7,030				\$7,030				\$7,030								
25	TOTAL CONSTRUCTION COST - IRR. IMPROVEMENTS		\$30,183,300	\$1,758,800				\$1,375,600				\$2,902,000				\$3,369,800				\$2,968,110				\$2,968,110				\$2,968,110				\$2,968,110								

NOTES:

UNITED STATES - DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PRICE-SAN RAFAEL RIVERS UNIT
COLORADO RIVER WATER QUALITY IMPROVEMENT PROGRAM
DENVER OFFICE JANUARY 1990 UC REGION

L N I D N . E	PROGRAM ITEM	QUANTITY	ESTIMATED TOTAL	9TH YEAR				10TH YEAR				11TH YEAR				BALANCE TO COMPLETE	L N I D N . E
				10	20	30	40	10	20	30	40	10	20	30	40		
	1	2	3	4	5	6	7	8	9	10	11	12					
1																	
2	PROGRAM GOAL																
3	Salinity Reduction, Colorado River At Imperial Dam - Tons	7,940															
4																	
5	RECLAMATION CONSTRUCTION PROGRAM																
6	Irrigation Improvement Increment																
7	Carbon Subarea																
8	Off-Farm Piped Laterals	To Treat 7600	\$8,090,000	\$802,500	\$802,500	\$802,500											
9	Off-Farm Mitigation	Acres	\$122,400	\$8,740	\$8,740	\$8,740											
10	Cottonwood Subarea																
11	Off-Farm Piped Laterals	To Treat 4760	\$5,430,000	\$538,600	\$538,600	\$538,600											
12	Off-Farm Mitigation	Acres	\$170,000	\$12,100	\$12,100	\$12,400											
13	Ferron Subarea																
14	Off-Farm Piped Laterals	To Treat 5050	\$6,560,000	\$650,700	\$650,700	\$650,700											
15	Off-Farm Mitigation	Acres	\$185,300	\$13,200	\$13,200	\$13,500											
16	Huntington-Cleveland Subarea																
17	Off-Farm Piped Laterals	To Treat 4815	\$5,090,000	\$505,000	\$505,000	\$505,000											
18	Off-Farm Mitigation	Acres	\$315,000	\$22,600	\$22,600	\$22,300											
19	Noore Subarea																
20	Off-Farm Piped Laterals	To Treat 560	\$632,000	\$62,700	\$62,700	\$62,700											
21	Off-Farm Mitigation	Acres	\$45,400	\$3,240	\$3,240	\$3,240											
22	Price-Wellington Subarea																
23	Off-Farm Piped Laterals	To Treat 3215	\$3,444,000	\$341,700	\$341,700	\$341,700											
24	Off-Farm Mitigation	Acres	\$98,400	\$7,030	\$7,030	\$7,020											
25	TOTAL CONSTRUCTION COST - IRR. IMPROVEMENTS		\$30,183,300	\$2,968,110	\$2,968,110	\$2,968,440											

NOTES:

Preconstruction
and other work Construction

CONTROL SCHEDULE

L I N E	PROGRAM ITEM	QUANTITY	ESTIMATED TOTAL	PRECONSTRUCTION:												BALANCE TO COMPLETE	L I N E																								
				1ST YEAR				2ND YEAR				3RD YEAR						4TH YEAR				5TH YEAR				6TH YEAR				7TH YEAR				8TH YEAR							
				1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q			1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
1																																									
2	PROGRAM GOAL																																								
3	Salinity Reduction, Colorado River At Imperial Dam - Tons	32,880																																							
4																																									
5	RECLAMATION CONSTRUCTION PROGRAM																																								
6	Winter Water Increment																																								
7	Cottonwood Creek M&I Pipeline	10.6 M	\$2,221,000		\$133,600		\$417,400		\$1,670,000																																
8	NEMAR System Expansion - Connections	163	\$715,000		\$42,900		\$134,000		\$269,000		\$269,000																														
9	PRMIB System Expansion - Connections	50	\$158,000		\$9,500		\$29,700		\$119,000																																
10	Stockwater Ponds - Lined Ponds	83	\$1,849,000		\$111,200		\$347,800		\$695,000		\$695,000																														
11	Fish & Wildlife Mitigation		\$236,000						\$236,000																																
12																																									
13	TOTAL WINTER WATER INCREMENT		\$5,179,000		\$297,200		\$928,900		\$2,753,000		\$1,200,000																														
14	TOTAL OBLIGATIONS		\$35,362,300		\$2,056,000		\$2,304,500		\$5,655,000		\$4,569,800		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		\$2,968,110		
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NOTES:

BIB installation schedule preferred plan
P'rice-San Rafael River basin

Activity	1st year		2nd year		3rd year		4th year		5th year	
	Federal	Other	Federal	Other	Federal	Other	Federal	Other	Federal	Other
Financial assistance (\$1,000 units, 1989 prices)										
On-farm irrigation			1,760	760 8	2,000	867 1	2,260	904 2	2,260	964 2
Voluntary habitat replacement			135	57 8	158	67 7	177	75 8	177	75 8
Technical assistance										
Installation	470	11	790	19 2	790	19 2	790	19 2	790	19 2
Monitoring and evaluation	100		100		100		100		120	
Information and education	40		40		40		40		40	
Total	610	11	2,815	827 8	3,088	914 0	3,357	1,059 2	3,357	1,059 2

Activity	6th year		7th year		8th year		9th year		10th year	
	Federal	Other	Federal	Other	Federal	Other	Federal	Other	Federal	Other
Financial assistance (\$1,000 units, 1989 prices)										
On-farm irrigation	2,260	904 2	2,260	904 2	2,260	904 2	2,000	867 1	2,000	857 1
Voluntary habitat replacement	177	75 8	177	75 8	177	75 8	158	67 7	158	67 7
Technical assistance										
Installation	790	19 2	790	19 2	790	19 2	790	19 2	790	19 2
Monitoring and evaluation	100		100		100		100		100	
Information and education	40		40		40		40		40	
Total	3,357	1,059 2	3,357	1,059 2	3,357	1,059 2	3,088	944 0	3,088	944 0

Activity	11th year		12th year		13th year		14th year		Total funds
	Federal	Other	Federal	Other	Federal	Other	Federal	Other	
Financial assistance (\$1,000 units, 1989 prices)									
On-farm irrigation	1,280	151 1							28 974
Voluntary habitat replacement	117	50 1							2,301
Technical assistance									
Installation	626	10	410	10	311	8			9 111
Monitoring and evaluation	80		93		80		40		1,313
Information and education	40								40
Total	2,143	616 2	513	10	391	8	40	0	42,171

**CALCULATIONS ESTIMATING IMPACTS TO
WETLANDS AND WILDLIFE HABITAT
RESULTING FROM THE ON-FARM PROGRAM**

ATTACHMENT VII

Project Impacts (SCS) on Wetlands

Introduction:

The evaluation methods, rationale, and assumptions for estimating on-farm impacts are discussed in the following sections. No values were assigned to the wetland/wildlife habitat in the basin during the inventory. Habitat values will be determined during individual plan development and through the Monitoring and Evaluation Program.

General Assumptions:

The CRSC program is a voluntary participation program. SCS is unable to predict specific impacts for a given area or farm; therefore, assumptions and index values based on the assumptions were used to estimate a "worst" case analysis. The indexes were calculated to determine a gross acreage loss or change in the wetland vegetation. There are three primary assumptions (further defined in the calculation process explained below). The three primary assumptions were:

- All significant land units that could potentially participate in the program were included in the project area.
- Not all acreage will be treated.
- Loss or change of artificial wetland vegetation and upland vegetation (supported by irrigation water) is related to changes in the water budget from improved irrigation water management and construction activities. A review of the hydrology and geology shows a majority of wetlands in the project area are either entirely or partially supported by irrigation. The proposed NED & RP plans impact irrigation water; therefore, the wetland impacts are restricted to only wetlands (or the segment of the wetland) supported by irrigation.

- Amount of loss or magnitude of change in vegetation is related to its location in relation to the irrigated field.

Index Calculations:

Based on the above assumptions and relationships, the impact index values were calculated by the following method.

First, the acreage index (acreage potentially treated by the program) was calculated by dividing the estimated total treated acres by the sum of the partially and fully irrigated acres that would exist without a project (No Action) (Table V-5). This results in an estimate of approximately 58 percent of the acres being treated under the NED alternative and an additional 22 percent of currently irrigated lands potentially treated under the resource protection (RP increment) plan. [NOTE: The RP plan includes the NED and the RP increment.] These acres were identified as subject to potential impacts based on the assumption that existing (inventoried) wetland vegetation is associated with areas receiving the most irrigation water and, therefore, are subject to the greatest potential alteration. Acres that are infrequently irrigated were excluded from the index derivation because they are sporadically irrigated, support primarily native salt-desert vegetation, and will not change significantly as a result of plan implementation.

The second index is related to the impacts from construction in the fields. It is a proportional estimate of the area disturbed by activities associated with installing and operating various irrigation systems. Based on the SCS's experience with other programs, the construction impact index for the NED plan acreage was operationally defined at 75 percent, and the RP plan was operationally defined as 65 percent.

The third index value, a water budget index value, was based on the assumption that impacts on treatable acres would be influenced by changes in the water budget. To address this assumption an index was developed from estimated reductions in deep percolation. It is impossible to determine the exact quantity of deep percolation water that would be affected by SCS's on-farm measures. For the purposes of the analysis, however, an estimated 64,670 acre-feet (average annual) was identified under future without the project conditions as the amount of irrigation water currently deep percolating to be used for index development. The NED plan has an estimated depletion of 19,645 acre-feet (average annual) depletion and the RP (increment) plan has an additional estimated depletion of 2,815 (total 22,460) acre-feet (average annual) depletion, attributable to the on-farm activities. The depletion for each alternative was divided by the amount of FWOP (19,645 acre-feet/64,670 acre-feet) to obtain a 30 percent change for the NED and an additional (2,815 acre-feet/64,670 acre-feet) 4 percent change resulting from the SCS portion of the RP plan. It is assumed that some additional alteration of vegetation would occur from plan installation. Examples of changes include construction of pipelines, field consolidation, squaring of fields, dependency of vegetation on the subsurface return flows and other changes which impacts are impossible to predict. An attempt was made to account for these changes by doubling the percent for estimated change in the water budget.

The resultant water budget index for the on-farm component of the NED plan was operationally defined as 60 percent and the RP plan is operationally defined as an additional 8 percent.

Impact Calculations.--The above assumptions and indexes were used to obtain a "worst case" estimate of the total acres potentially impacted through full implementation of the on-farm irrigation practices. To facilitate analysis, on-farm inventoried wetlands were assumed to represent "No Action" conditions. The impacted areas were displayed by dividing the inventory into three general groups of: in-field, off-field (between the field and river bottoms), and river-bottom sites. It is not anticipated that the river-bottom habitat will change because the irrigation water has minimal effect on the hydrology of the riparian zone and floodplain. The indexes described above were applied to the first two general groups of wetlands for each alternative as follows:

A. Acreage Index and Construction Index: In-field Grass/sedge, Rush/cattail and Riparian tree/shrub/scrub habitat (includes wetlands, non-wetland riparian, and other upland vegetation associated with moisture from irrigation).

B. Acreage Index and Water Budget Index: In-field Pasture/hayland; Off-field Grass/sedge, Rush/cattail and Riparian tree/shrub/scrub habitat (includes wetlands, non-wetland riparian, and other upland vegetation associated with moisture from irrigation).

The in-field impacted areas (see A. above) were calculated by first applying the acreage index (58 percent - NED; 22 percent - RP increment) to the acres inventoried for the No Action. This identified the maximum potentially treated acres. This figure was then multiplied by the construction index which obtained the estimated impacted acres. The calculations were repeated for each vegetation type. The impacted acres (wetland/wild-life habitat lost and/or changed) were subtracted from the No Action acreage to obtain the acres remaining after installation which were displayed in Table V-4.

Example calculation for Group A:

- Inventory = 100 ac. in-field Grass/sedge wetland
- Projection for FWOP = 100 ac. in-field Grass/sedge wetland
- Acreage index (58%-NED; 22%-RP) is potential acres in program;
 No Action ac. X Acreage index = acres potentially treated;
 100 ac. X .58 = 58 ac. potentially treated - NED.
 100 ac. X .22 = 22 ac. additional. potentially treated - RP (increment).
 Total for RP (NED+RP)= 80 ac.

- d. Construction index (75%-NED; 65%-RP) is acres impacted by construction;
 Potential acres treated X Construction index =
 ac. impacted;
 58 ac. X .75 = 43 ac. impacted - NED (existing
 vegetation changed)
 22 ac. X .65 = 14 ac. impacted - RP (existing
 vegetation changed)
 Total for RP = 57 ac.
- e. Acres of habitat remaining are displayed on table with
 RP plan implemented;
 No Action ac. - (NED + RP increment) impacted acres =
 acres remaining
 100 ac. - 57 ac. = 43 ac. of habitat remaining.
- f. Repeat for each remaining in-field vegetation type.

The in-field Pasture/hayland and off-field areas impacted areas (see B. above) were calculated by first applying the acreage index (58 percent - NED; 22 percent RP) to the acres inventoried for the No Action. This identified the maximum potentially treated acres.

The water budget index was not uniformly applied to potentially treated acres (in-field and off-field) because it is assumed that the most significant change in irrigation water quantity will occur on the fields being directly irrigated. A less significant change will occur on the off-field sites that receive subsurface irrigation return flows from several farms and collect significant amounts of precipitation. Based on this assumption, the majority of the wetland losses will occur on, or immediately adjacent to, the in-field pasture/hayland (wetlands). The significance of the impacts will decrease as distance from the irrigated fields increase.

To represent this, approximately 75 percent of the impacted acres were assumed to occur on the Pasture/hayland(wetland), with the remaining 25 percent of the impacted acres pro-rated in the other identified off-field vegetation types. Using these adjustments, the calculations were repeated for each vegetation type. The impacted acres (wetland/wildlife habitat lost and/or changed) were subtracted from the No Action acreage to obtain the acres remaining after installation which were displayed in Table V-4.

Example calculation for Group B:

- a. Inventory = 1000 ac. of in-field Pasture/hayland (wetland)
 200 ac. of off-field Grass/sedge
 150 ac. of off-field Rush/cattail
 175 ac. of off-field Riparian scrub/shrub,
 forest
- b. Projection for No Action =
 1000 ac. of in-field Pasture/hayland (wetland)
 200 ac. of off-field Grass/sedge
 150 ac. of off-field Rush/cattail
 175 ac. of off-field Riparian scrub/shrub,
 forest
- c. Acreage index (58%-NED;22%-RP) is potential acres in
 program;
 No Action ac. X Acreage index = potential acres treated;
 NED:
 Pasture/hay 1000 ac. X .58 = 580 ac. potentially treated
 Grass/sedge 200 ac. X .58 = 116 ac. potentially treated
 Rush/cattail 150 ac. X .58 = 87 ac. potentially treated
 Riparian 175 ac. X .58 = 101 ac. potentially treated
 NED Total = 884 ac. potentially treated
- RP:
 Pasture/hay 1000 ac. X .22 = 220 ac. potentially treated
 Grass/sedge 200 ac. X .22 = 44 ac. potentially treated
 Rush/cattail 150 ac. X .22 = 33 ac. potentially treated
 Riparian 175 ac. X .22 = 38 ac. potentially treated
 RP increment only Total = 335 ac. potentially treated
 Total for RP Plan (NED+RP increment) = 1219 ac. potential-
 ly treated
- d. The Water Budget Index for each alternative is used to
 adjust the potentially treated acres;
 Total acres potentially treated X Water Budget Index =
 impacted acres;
 884 ac. X .6 = 530 ac. total impacted between in-field
 pasture/hayland & off-field for NED.
 335 ac. X .08 = 27 ac. total impacted between in-field
 pasture/hayland & off-field for RP (increment).
 Total impacted for the RP plan (NED+RP increment)
 = 557 ac. (530 + 27)
- e. Adjustment for in-field Pasture/hayland vs. off-field
 (75% vs. 25%);
 Total impacted X .75 = acres of Pasture/hayland impacted;
 530 X .75 = 398 ac. Pasture/hayland impacted for the NED;
 27 X .75 = 20 ac. Pasture/hayland impacted for the RP
 Total for the RP Plan (NED+RP) = 418 ac. impacted (loss)
 The remaining 25 percent of the acres treated (139 ac.)
 was pro-rated among the three off-field vegetation types
 using percent of total of the three;

(Acres of type/total of 3 types) X 25 percent of total
impacted acres = acres of vegetation type impacted;

NED PLAN:

(200/(200+150+175)) X 132 = 50 ac. Grass/sedge impacted
(150/(200+150+175)) X 132 = 38 ac. Rush/cattail impacted
(175/(200+150+175)) X 132 = 44 ac. Riparian impacted

RP PLAN (increment):

(200/(200+150+175)) X 7 = 3 ac. Grass/sedge impacted
(150/(200+150+175)) X 7 = 2 ac. Rush/cattail impacted
(175/(200+150+175)) X 7 = 2 ac. Riparian impacted

Total for the RP Plan (NED+RP increment) =

53 ac. Grass/sedge impacted (loss)
40 ac. Rush/cattail impacted (loss)
46 ac. Riparian impacted (loss)

- f. Acres of habitat remaining are displayed on table with
RP plan implemented;

FWOP - Impacted acres (loss) = acres remaining

NED Plan:

1000 ac. - 398 ac. = 602 ac. Pasture/hayland remaining
200 ac. - 50 ac. = 150 ac. Grass/sedge remaining
150 ac. - 38 ac. = 112 ac. Rush/cattail remaining
175 ac. - 44 ac. = 131 ac. Riparian remaining

RP Plan (NED + RP increment)

1000 ac. - 418 ac. = 582 ac. Pasture/hayland remaining
200 ac. - 53 ac. = 147 ac. Grass/sedge remaining
150 ac. - 40 ac. = 110 ac. Rush/cattail remaining
175 ac. - 46 ac. = 129 ac. Riparian remaining

Accuracy of acres impacted.--The actual magnitude of impacts to wetland/wildlife habitat will depend on the amount of participation in the program. The estimates of acres impacted are for use in decision making for comparing the significance of impacts caused by the RP plan. The actual impacts will probably be less than the estimates used in Table V-4 because a "worst case" analysis was used.

NOTE: Slight difference between calculated acres and acres displayed in the table(s) are due to rounding.

DRAFT 2/15/91

EVALUATION OF IMPACTS OF RESOURCE PROTECTION PLAN
on the

DESERT LAKE WATERFOWL MANAGEMENT AREA

&

OLSEN RESERVOIR

COLORADO RIVER SALINITY CONTROL PROGRAM
(USDA ON-FARM COMPONENT)
PRICE/SAN RAFAEL RIVER BASIN
UTAH

Soil Conservation Service
Utah
February 1991

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Purpose of Report: This report was prepared as part of the Draft Environmental Impact Statement (DEIS) for the Price/San Rafael River Basin Salinity Control Program. The DEIS has been jointly prepared by the Soil Conservation Service (SCS) and the Bureau of Reclamation (USBR). This report addresses only the anticipated impacts to Desert Lake and Olsen Reservoir as a result of SCS assisting with installation of proposed on-farm irrigation improvements.

Background: This evaluation is to assess project impacts to open water areas and adjacent wetlands of the Desert Lake waterfowl management area and Olsen Reservoir. The Desert Lake area is managed by the Utah Division of Wildlife Resources for waterfowl. It receives irrigation water according to their water rights and both surface and sub-surface irrigation return flows from the Cleveland Canal Company system. Olsen Reservoir is privately owned and not specifically managed for waterfowl, but it is used frequently by waterfowl during the migration season. It receives both surface and sub-surface irrigation return flows from the Carbon Canal Company system. Water from both areas drains into the Price River.

Proposed Project: The objective of the on-farm component of the Salinity Control Program is to improve water quality (reduce salt loading) in the Colorado River (Public Law 93-320, as amended) by improving irrigation efficiency. The improved irrigation efficiency reduces deep percolation (movement of ground water through salt bearing soil and rock formations) which transport salts to the Colorado River. The improvements in irrigation systems and irrigation water management will result in increased evapo-transpiration by agricultural crops. The outcome will be a net reduction in subsurface irrigation return flows.

Project Alternatives: The Future Without Project (FWOP) (No Action) alternative is the base against which the other alternatives are compared. Several alternatives were analyzed and presented to the local people. The Resource Protection (RP) alternative (combination of irrigation systems) is the selected plan.

Impact Evaluation: The implementation of the selected plan (RP) will cause changes relating to water quality, agricultural production, water quantity and other environmental factors. This report deals primarily with the changes in water quantity which were identified as a concern

by the UDWR. The changes in water quantity were developed from USGS data. A water budget for the entire project area is contained in the preceding DEIS.

The following are brief summaries of the FWOP and the RP Plan and the anticipated project impacts to the water/wetlands within the two areas:

1. Future Without Project (FWOP): This alternative is an estimate of the future conditions of the resources for the evaluation period. This alternative is the base against which the other alternatives are compared. It is estimated, for the purpose of this project, that conditions in irrigated agriculture would remain basically the same with continued agricultural land losses due to upward migration of salts. There would be minimal application of practices mentioned in the following alternatives. There would be no significant change in the water quality and quantity of return flows supplying the wetland areas.

2. RP (Selected Plan): This plan proposes the installation of several different irrigation systems (surface, pump sprinkler and gravity sprinkler) and implementation of improved irrigation water management. The change in the return flow was calculated on an average annual basis. When compared to the FWOP, this alternative would:

- a. improve downstream water quality by reducing salt loading 106,800 annually,
- b. reduce the sub-surface irrigation return flow to the Colorado River by 22,460 acre-feet annually (average).

The improved systems and irrigation water management will result in increased evapo-transpiration which reduces deep percolation and sub-surface return flows. In addition it causes a lag in ground water and surface return flows due to a more uniform distribution of irrigation water over time. The greatest net decrease in return flow would occur during the late spring and early summer months. Sub-surface return flows during the late fall and early winter months would be reduced only slightly. The slight decrease would result from the anticipated lag time which will maintain a higher flow for a period of time following the irrigation season.

Discussion: The following table and graphs (pages 5 thru 7) provide comparisons of average annual water supplies under the FWOP and the RP plan. The FWOP and projections for the RP plan are based on a calculated average annual water budget. It should be noted that the water rights for Desert Lake are not affected by project implementation. In addition the spring high flows that normally fill Desert Lake will not be impacted by program implementation. The SCS does not have any authority dealing with water rights. Water rights are the responsibility of the State of Utah.

A meeting was held in December, 1990 between DWR, USF&WS, Utah Div. of Water Rights, Reclamation, BLM and SCS to discuss water rights and the anticipated impacts to Desert Lake and Olsen Reservoir.

The anticipated impacts of the RP Plan on the water budget for Desert Lake and Olsen Reservoir are displayed in Table 1. The RP Plan causes an estimated reduction of 3500 acre-feet annually. A CH2MHILL report stated that a minimum of 4 cubic feet per second (cfs) is needed to maintain the open water (level full), while providing a flow through of 2 cfs^{1/2}. The RP plan would reduce outflows from 22 cfs down to approximately 17 cfs. during an average water year. The flow through will be reduced from FWOP; however, the remaining flow through is well in excess of that required. The reduction will not impact the open water areas. The decreased sub-surface return flows could reduce some areas of wetland vegetation in the upstream edges of the waterfowl management area, well away from the open water areas. The reduction will occur in the transition zone where upland and wetland meet. The wetland vegetation in these areas will be replaced by upland plants. The changes in the vegetation (phreatophytes) areas are included in Table VI-5, page VI-2?, of the DEIS section on the Affected Environment and Environmental Consequences.

Concern was expressed that the impact would be most severe during drought years. During 1987-1990 the area experienced a drought. Due to reduced irrigation water supplies, the landowners above Desert Lake and Olsen Reservoir have been irrigating at approximately 60% efficiency. The implementation of the RP plan targets a 60% average efficiency (long term average). In drought years, the FWOP irrigation return flows are similar to the RP Plan

1/ CH2MHILL, Alternative Plans Report, Salinity Investigation for the Price - San Rafael Rivers Unit, Colorado River Water Quality Improvement Program, Submitted to the U.S. Bureau of Reclamation, Dept. of the Interior, Contract No. 1-07-40-51637 (Preliminary), March 1982.

TABLE 1
WATER BUDGETS

	DESERT LAKE		OLSEN RESERVOIR	
	FWOP	RP PLAN	FWOP	RP PLAN
INFLOW (Acre Feet)				
Irrg. Rtn. Flows 1/	6300 8/	3000		
Spillage (canal) 2/	1000	800	2100	900
Annual Precip. 3/	9800	9800	1000	850
Irrg. Water Right 4/	825	825	3900	3900
	-----	-----	-----	-----
Total	17925	14425	7000	5650
OUTFLOW (Acre Feet)				
Evaporation	2600	2600	475	475
Water Flow Thru 5/	13125	9625	6125	4775
	-----	-----	-----	-----
Total 6/	15725	12225	6600	5250
Capacity (Acre Feet) (water + evap.)	2200	2200	400	400
Surface Area (Ac) 7/	544	544	100	100

To obtain cubic feet per second (cfs), averaged for a year, multiply acre feet by 0.0014.

- 1/ Irrigation Return Flows - Includes canal seepage loss, irrigation deep precolation loss, surface runoff from farms.
- 2/ Spillage - Includes early spring spillage (unused irrigation water).
- 3/ Annual Precipitation - Total annual precipitation contribution.
- 4/ Irrigation Water Right - Water Rights owned by the Division of Wildlife Resources that are for Desert Lake.
- 5/ Water Flow Through - Water that flows through the reservoir or lake.
- 6/ Total represents all outflow.
- 7/ Surface Area (Acres) - Area of open water.
- 8/ All flows are average annual and have been rounded.

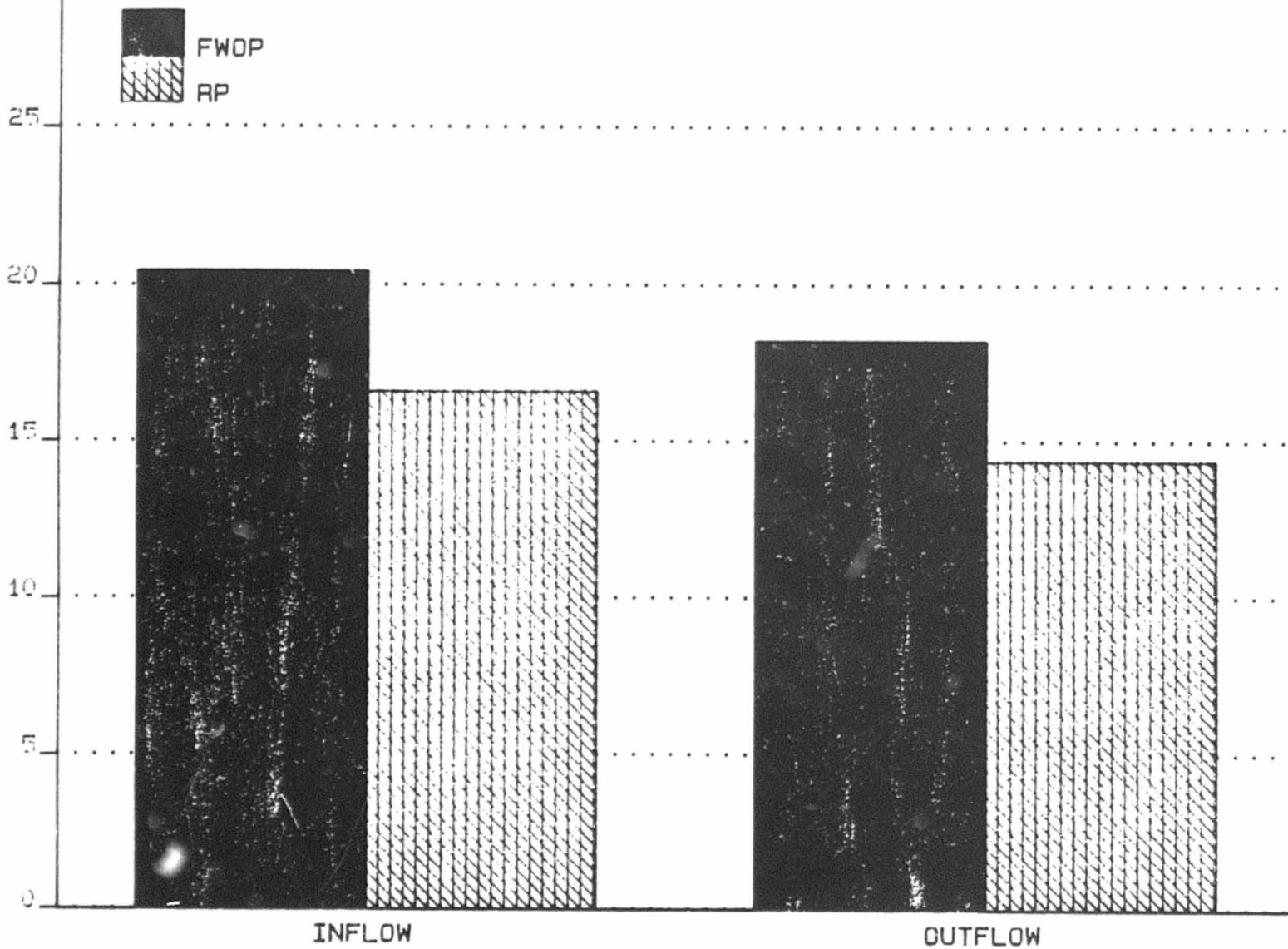
4
efficiencies, therefore there would be no significant impact in drought years as a result of project implementation.

Olsen Reservoir was not mentioned in the CH2MHILL report and no other data was available. It is assumed the level of impacts will be similar to Desert Lake.

Method of Calculation: Flow data was obtained from average annual stream flow hydrographs from published U.S. Geological Survey Reports. Flow data was interpolated if no gaging station was in the immediate area.

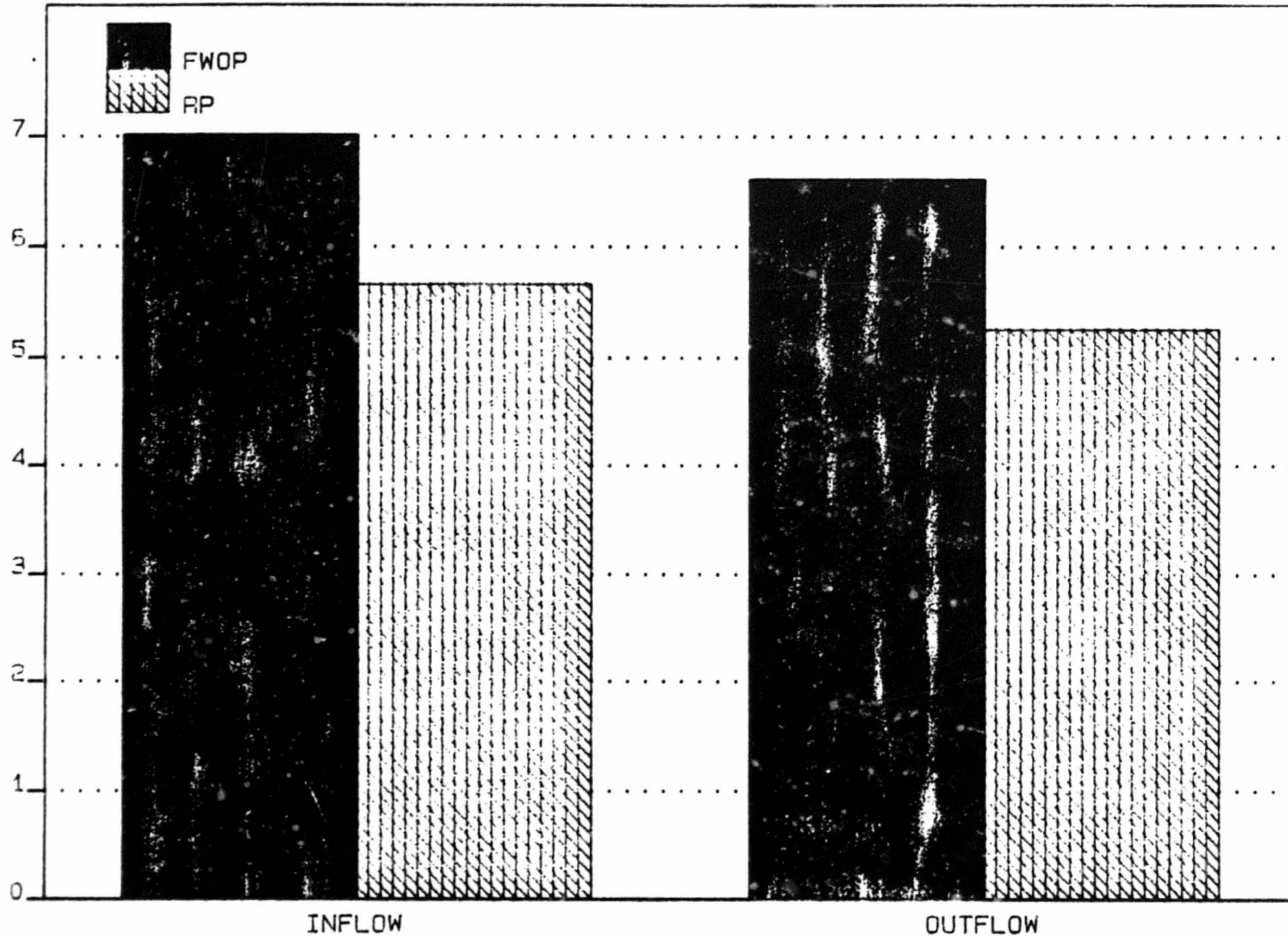
Conclusions: Based on the water budgets there will not be significant project related impacts to the open water areas and adjacent wetland vegetation of Desert Lake or Olsen Reservoir.

DESERT LAKE (Avg. Annual Hydrograph)



FWOP = Future w/o Project; RP = Resource Protection Plan

OLSEN RESERVOIR (Avg. Annual Hydrograph)



FWOP = Future w/o Project; RP = Resource Protection Plan

ATTACHMENT VIII

Evaluation of Alternative
Plans on the Roundtail Chub

DRAFT 2/15/91

EVALUATION OF IMPACTS OF RESOURCE PROTECTION PLAN
on the

ROUNDTAIL CHUB
(Gila robusta robusta)

COLORADO RIVER SALINITY CONTROL PROGRAM
(USDA ON-FARM COMPONENT)
PRICE/SAN RAFAEL RIVER BASIN
UTAH

Soil Conservation Service
Utah
February 1991

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Purpose of report: This report was prepared as part of the Draft Environmental Impact Statement (DEIS) for the Colorado River Salinity Control (CRSC) Program, Price/San Rafael River Basins. The DEIS is being jointly prepared by the Soil Conservation Service (SCS) and the Bureau of Reclamation (USBR). This report addresses the anticipated impacts to the Roundtail chub as a result of SCS assisting with installation of proposed on-farm irrigation improvements.

Background: The evaluation of the changes in stream flows was requested by Larry Dalton, Resource Analyst, Utah Division of Wildlife Resources (UDWR), Southeastern Region, to assess the impacts to the Roundtail chub (Gila robusta robusta). The species is on a list of "Native Utah Wildlife Species of Special Concern" UDWR, December 1987 (Revised). This list does not accord legal status to the Roundtail chub.

Larry Dalton provided information that the following streams within the Price/San Rafael Rivers Basin are inhabited by the Roundtail chub below the irrigation diversions:

- Price River (below the Carbon-Emery County line)
- Huntington Creek
- Cottonwood Creek
- Ferron Creek
- San Rafael River
- Muddy Creek (Not evaluated because it is not impacted by the proposed project.)

Note: Huntington Creek, Cottonwood Creek, Ferron Creek are tributaries of the San Rafael River.

Proposed Project: The objective of the on-farm component of the CRSC Program is to improve water quality (reduce salt loading) in the Colorado River (Public Law 93-320, as amended) by improving irrigation efficiency. The improved irrigation efficiency reduces deep percolation (movement of ground water through salt bearing soil and rock formations) which transport salts to the Colorado River. The improvements in irrigation systems and irrigation water management will result in increased evapo-transpiration by agricultural crops. The outcome will be a net reduction in irrigation return flows to the streams. The change in return flows varies with each alternative. It should be noted that the SCS has no authority to protect water flows in the stream, that is a state responsibility.

Project Alternatives: Three alternatives were presented to the local people. The Future Without Project (FWOP) - No Action, alternative is the base against which the other alternatives are compared. The Resource Protection (RP) alternative, (combination of irrigation systems), was selected by the local people. The National Economic Development (NED) alternative (gravity/pump sprinkler irrigation system) was evaluated and is included for comparison.

Impact Evaluation: The implementation of the selected alternative (RP) will cause changes relating to water quality, agricultural production, water quantity and other environmental factors. This report deals primarily with the changes in water quantity which were identified as a concern by the UDWR. The changes in water quantity were developed from USGS data. A complete water budget is contained in the DEIS.

The following are brief summaries of the two proposed alternatives and anticipated project impacts to the stream inhabited by the Roundtail chub:

1. FWOP: This alternative is an estimate of the future conditions of the resources for the evaluation period. This alternative is the base against which the other alternatives are compared. It is estimated, for the purpose of this project, that conditions in irrigated agriculture would remain basically the same. There would be minimal application of practices mentioned in the following alternatives. There would be no significant change in the water quality and quantity of return flows supplying the streams.

2. RP (Selected Plan): This alternative proposes the installation of several different irrigation systems (surface, pump sprinkler and gravity sprinkler) and implementation of improved irrigation water management. The changes in the return flow were calculated on an average annual basis. When compared to the FWOP, this alternative would:

- a. improve downstream water quality by reducing salt loading by 120,200 tons annually,
- b. reduce the sub-surface irrigation return flow to the Colorado River by 22,460 acre-feet annually.

The improved systems and irrigation water management will result in increased evapo-transpiration which reduces deep percolation and sub-surface return flows. In addition it causes a lag in ground water and surface return flows due to a more uniform distribution of irrigation water over time. The most significant decrease in sub-surface return flow would occur during months (May - August) of high stream flow. During the months of normally low stream flow (September - April) the impact would generally be a slight reduction in stream flow. The slight decrease would result from the anticipated lag time which will maintain a higher flow for a period of time following the irrigation season.

Discussion: The following tables and hydrographs (pages 6-15) provide comparisons of average monthly stream flows. Stream flows are based on available USGS data. Most of the streams above the project area are controlled by dams. The dams are under control of other federal, state and local agencies and actual stream flow is the result of the dam operation. SCS has no authority in operation of any of the dams or water rights. The SCS does not have any authority dealing with water rights. Water rights are the responsibility of the State of Utah.

The trend in stream flow for the RP plan is that the most significant reductions (5% to 50% below average) generally occur during high flow periods (May - Aug.). Generally only small decreases in flow (0% to 14% below average) will occur during the low flow periods, with the exception of Ferron Creek.

The information provided here reflects the estimated changes in stream flows in the project area and does not attempt to report on the life history of the Roundtail chub. Several articles were reviewed covering recent studies on the Roundtail chub and other desert fishes in an attempt to relate these flow changes to possible impacts on the Roundtail chub in this system. A brief review of the literature uncovered no information specifically regarding the Roundtail chub in the Price-San Rafael drainage. One related article described a study on the feeding habits of the endemic fishes in Aravaia Creek, AZ (Schreiber & Minckley, 1981), includes the Roundtail chub, and states that low flows were shown to be down to 1.8 cfs during the study period. This equates to 108 acre-feet of water if this flow were maintained for a month.

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The lowest average monthly flow with the selected plan on any of the streams, with the exception of Ferron Creek, was 16.6 cfs (990 acre-feet per month), well above the lowest flow in the Arizona study in which a Roundtail chub population was surviving. USGS records actually show that at times Aravaipa Creek, AZ has had no flow.

Ferron Creek displays a greater fluctuation in stream flows because there is essentially no continuous natural flow below the Mill Site Dam. The stream flow below the dam is primarily dependent on irrigation return flows (surface and sub-surface). Compared to the other streams, Ferron Creek has a lower stream flow and greater sensitivity of the flow to changes in irrigation return flows. The average flow in Jan. - Mar. is only 2.6 cfs (160 acre-feet per month) which is only slightly above the 1.8 cfs noted in the Schreiber & Minckley study (1981). The selected plan is anticipated to reduce flows for the same time period to 1.2 cfs (70 acre-feet per month). This is below the 1.8 cfs in the study by Schreiber & Minckley (1981), however the Mill Site Dam has a much more significant impact on the stream flow in Ferron Creek. The estimated reduction to 1.2 cfs is the "worst" case change anticipated to occur from implementation of the CRSC Program. An example is that in 1989 the Mill Site Dam, on Ferron Creek, has retained all available stream flow and there is discontinuous flow in the creek.

Concern was expressed that the impact would be most severe during drought years. During 1987-1990 the area experienced a drought. Due to reduced irrigation water supplies, the landowners in the project area have been irrigating at approximately 60% efficiency. The implementation of the RP plan targets a 60% average efficiency (long term average). In drought years, the FWOP irrigation return flows are similar to the RP Plan efficiencies, therefore there would be no significant change in stream flows in drought years due to project implementation.

The stream flows displayed in the tables and graphs are averages. The high degree of variability of flow in these streams may actually affect habitat more than the reduction of irrigation return flows. An example of this variability is that in Ferron Creek, below the irrigated area, during June, July and August of 1977 there was no flow for a total of 49 days (USGS gaging station at Paradise Ranch). While in June of 1980 the flow exceeded 900 cfs for eighteen consecutive days and the following year was less than 9 cfs for all but three days for the same period.

It should be noted that the impacts to stream flows were evaluated on a "worst case" basis. Implementation of any alternative will not get full anticipated participation or uniform application of practices. Therefore, actual impacts will be of a lesser magnitude than described in this report.

Method of Calculation: Flow data was obtained from average annual stream flow hydrographs from published U.S. Geological Survey Reports. Flow data was interpolated if no gaging station was in the immediate area.

Conclusion: It is concluded that the selected plan will not have a significant impact on the existing Roundtail chub populations, based on the analysis of flow data available for the Price-San Rafael drainage and the limited data available on flows required for the Roundtail chub.

Literature Cited

Schreiber, Donald C. and W.L. Minckley. Feeding Interrelations of Native Fishes in a Sonoran Desert Stream, Great Basin Naturalist, Vol 41, No.4, December 1981, pp. 409-426.

-Jan-91

TABLE 1
COTTONWOOD CREEK - STREAM FLOW

Month (water year)	FWOP1/ (acft)3/ (1000's)	RP2/ (acft) (1000's)	Change Amt. (1000's)	Change %
OCT	4.55	4.34	-0.21	-4.6%
NOV	1.47	1.38	-0.09	-6.1%
DEC	1.18	1.17	-0.01	-0.8%
JAN	1.08	0.99	-0.09	-8.3%
FEB	1.08	0.99	-0.09	-8.3%
MAR	1.88	1.79	-0.09	-4.8%
APR	2.40	2.20	-0.20	-8.3%
MAY	9.27	8.88	-0.39	-4.2%
JUN	16.60	14.84	-1.76	-10.6%
JUL	7.20	5.70	-1.50	-20.8%
AUG	5.03	4.65	-0.38	-7.6%
SEP	5.04	4.94	-0.10	-2.0%
	-----	-----	-----	
TOTAL (AVG. ANNUAL)	56.78	51.87	-4.91	

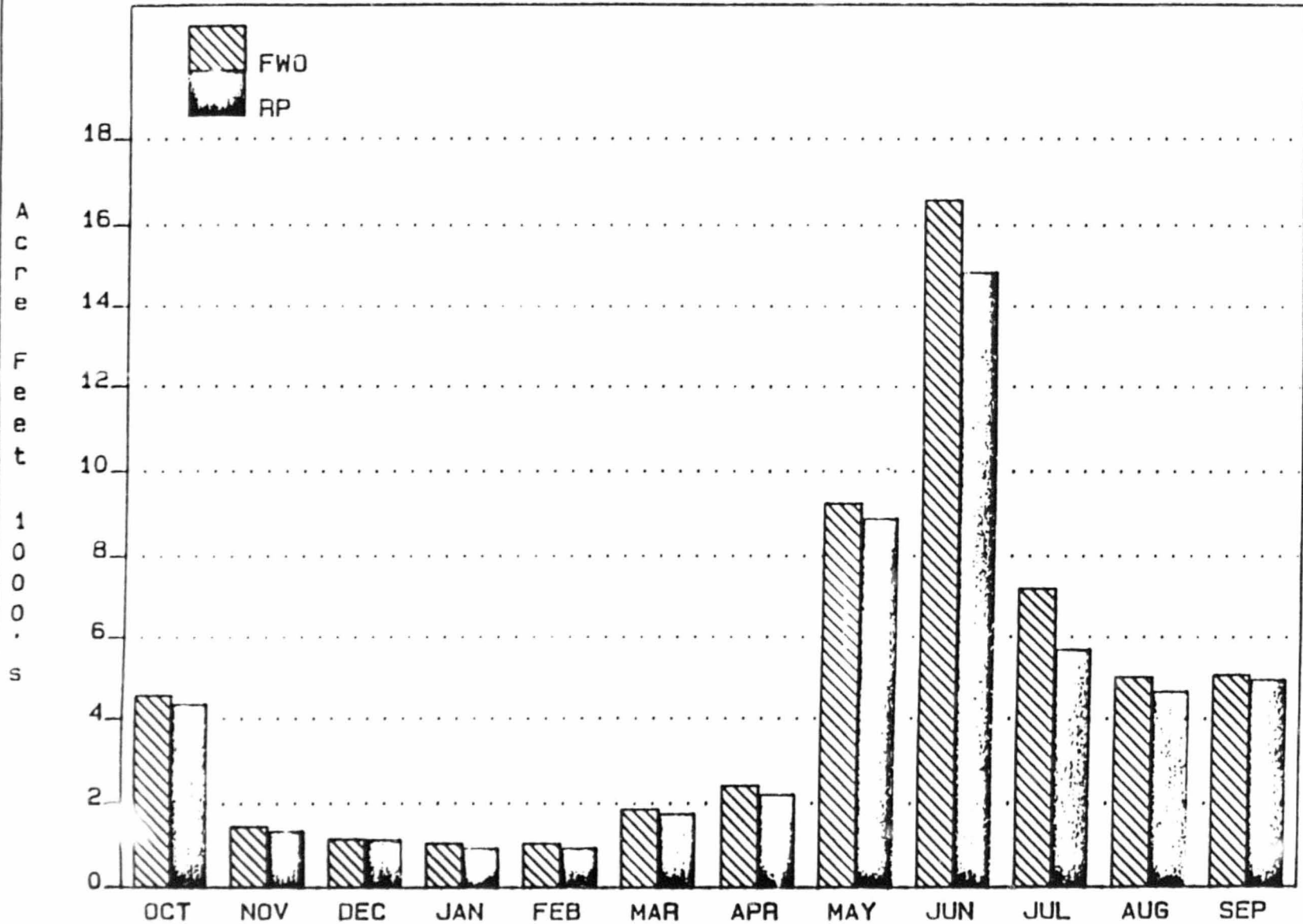
To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

1/ FWOP = Future without project

2/ RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

3/ acft = Acre foot (feet) of water (1 acft = 43,560 cu.ft)

COTTONWOOD CREEK (AVG. HYDROGRAPH)



FWOP = Future w/o Project; RP = Resource Protection Plan

17-Jan-91

TABLE 2
FERRON CREEK - STREAM FLOW

Month (water year)	FWOP1/ (acft)3/ (1000's)	RP2/ (acft) (1000's)	Change Amt. (1000's)	Change %
OCT	0.47	0.28	-0.19	-40.4%
NOV	0.32	0.21	-0.11	-34.4%
DEC	0.16	0.14	-0.02	-12.5%
JAN	0.16	0.07	-0.09	-56.3%
FEB	0.16	0.07	-0.09	-56.3%
MAR	0.16	0.07	-0.09	-56.3%
APR	0.38	0.23	-0.15	-39.5%
MAY	0.61	0.30	-0.31	-50.8%
JUN	12.55	11.07	-1.48	-11.8%
JUL	2.39	1.14	-1.25	-52.3%
AUG	1.30	0.98	-0.32	-24.6%
SEP	0.92	0.82	-0.10	-10.9%
	-----	-----	-----	
TOTAL (AVG. ANNUAL)	19.58	15.38	-4.2	

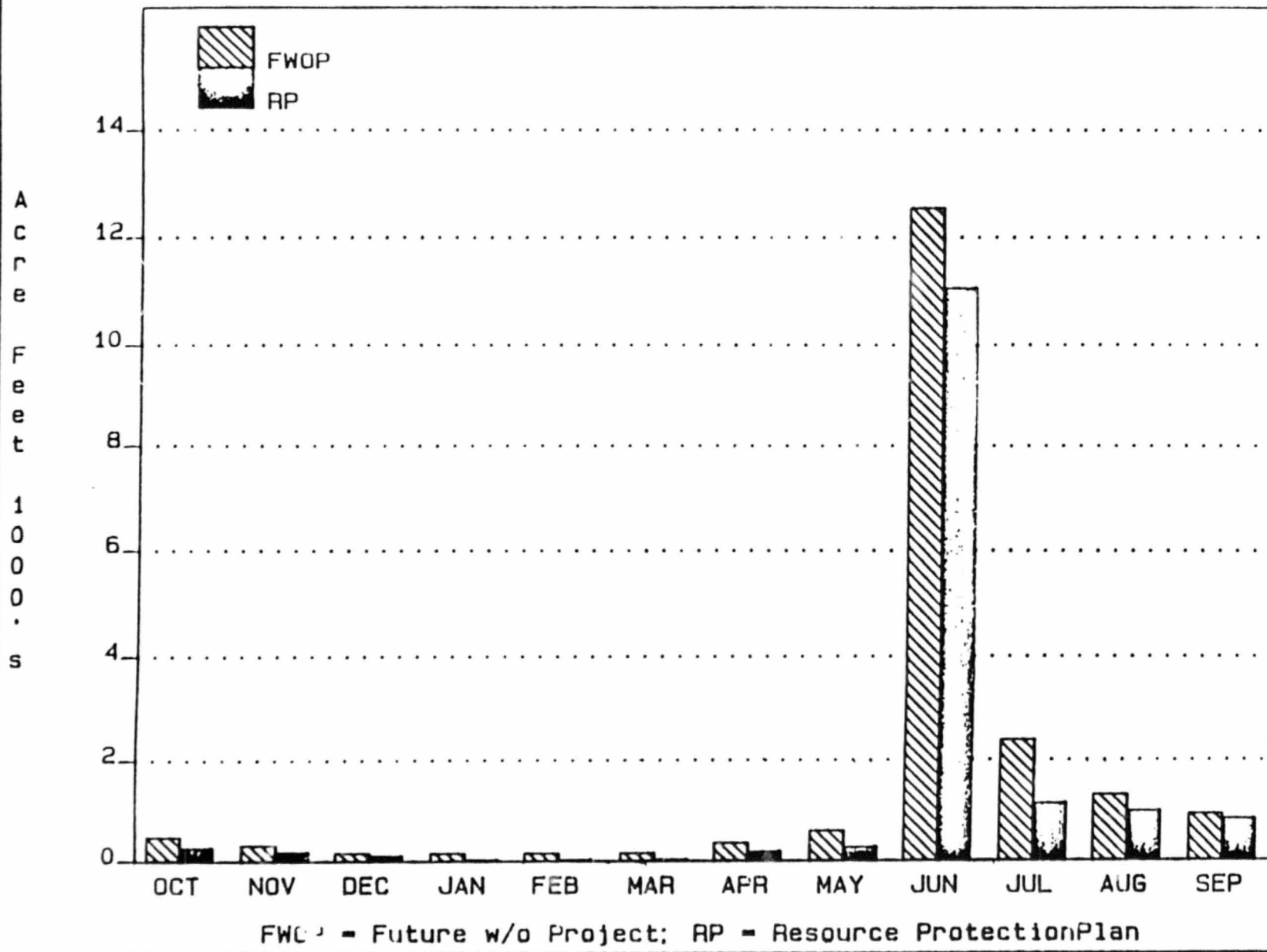
To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8. .

1/ FWOP = Future without project

2/ RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

3/ acft = Acre foot (feet) of water (1 acft = 43,560 cu. ft.)

FERRON CREEK (AVG. HYDROGRAPH)



17-Jan-91

TABLE 3
HUNTINGTON CREEK - STREAM FLOW

Month (water year)	FWOP1/ (acft)4/ (1000's)	RP2/ (acft) (1000's)	Change Amt. (1000's)	Change %
OCT	3.13	3.01	-0.12	-3.8%
NOV	2.02	1.96	-0.06	-3.0%
DEC	1.81	1.80	-0.01	-0.6%
JAN	1.71	1.65	-0.06	-3.5%
FEB	1.71	1.65	-0.06	-3.5%
MAR	2.21	2.15	-0.06	-2.7%
APR	3.42	3.32	-0.10	-2.9%
MAY	18.20	17.97	-0.23	-1.3%
JUN	13.78	12.72	-1.06	-7.7%
JUL	4.58	3.69	-0.89	-19.4%
AUG	5.15	4.93	-0.22	-4.3%
SEP	3.32	3.26	-0.06	-1.8%
TOTAL (AVG. ANNUAL)	61.04	58.11	-2.93	

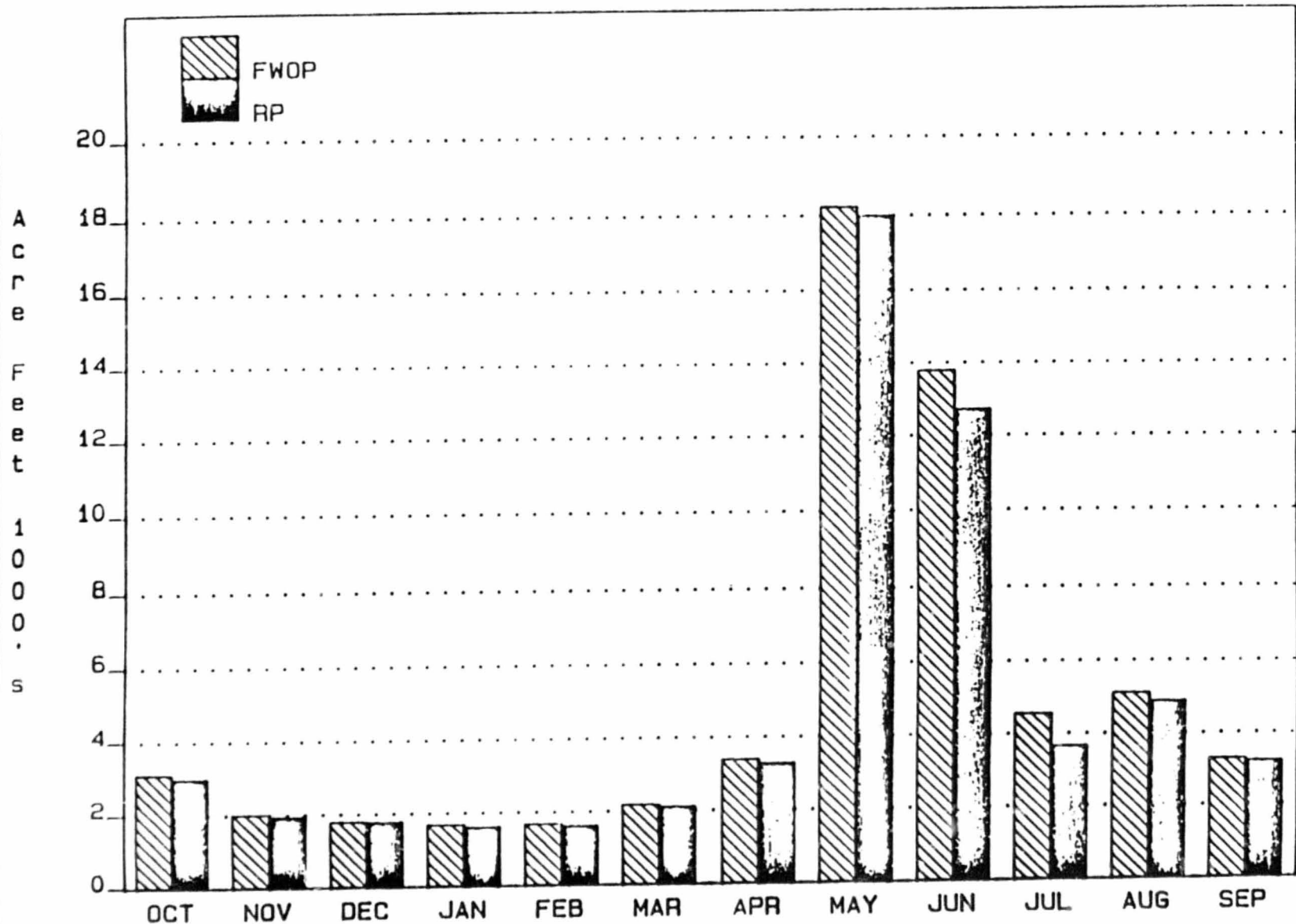
To obtain avg. daily cfs for a month, multiply the acre ft./mo (expressed in 1000's) by 16.8.

1/ FWOP = Future without project

2/ RP = Resource Protection Plan, Combination of surface and sprinkler irrigation systems to maximize salt load reduction to the Colorado River.

3/ acft = Acre foot (feet) of water (1 acft = 43,560 cu. ft.)

HUNTINGTON CREEK (AVG. HYDROGRAPH)



FWOP = Future w/o Project; RP = Resource Protection Plan

-Jan-91

TABLE 4
PRICE RIVER - STREAM FLOW

Month (water year)	FWOP1/ (acft)4/ (1000's)	RP2/ (acft) (1000's)	Change Amt. (1000's)	Change %
OCT	4.96	4.58	-0.38	-7.7%
NOV	2.83	2.64	-0.19	-6.7%
DEC	2.04	2.04	0.00	0.0%
JAN	1.67	1.48	-0.19	-11.4%
FEB	1.38	1.19	-0.19	-13.8%
MAR	6.01	5.82	-0.19	-3.2%
APR	9.36	8.97	-0.39	-4.2%
MAY	15.85	15.06	-0.79	-5.0%
JUN	13.02	9.36	-3.66	-28.1%
JUL	5.08	2.58	-2.50	-49.2%
AUG	4.44	3.79	-0.65	-14.6%
SEP	4.41	4.35	-0.06	-1.4%
TOTAL (AVG. ANNUAL)	71.05	61.86	-9.19	

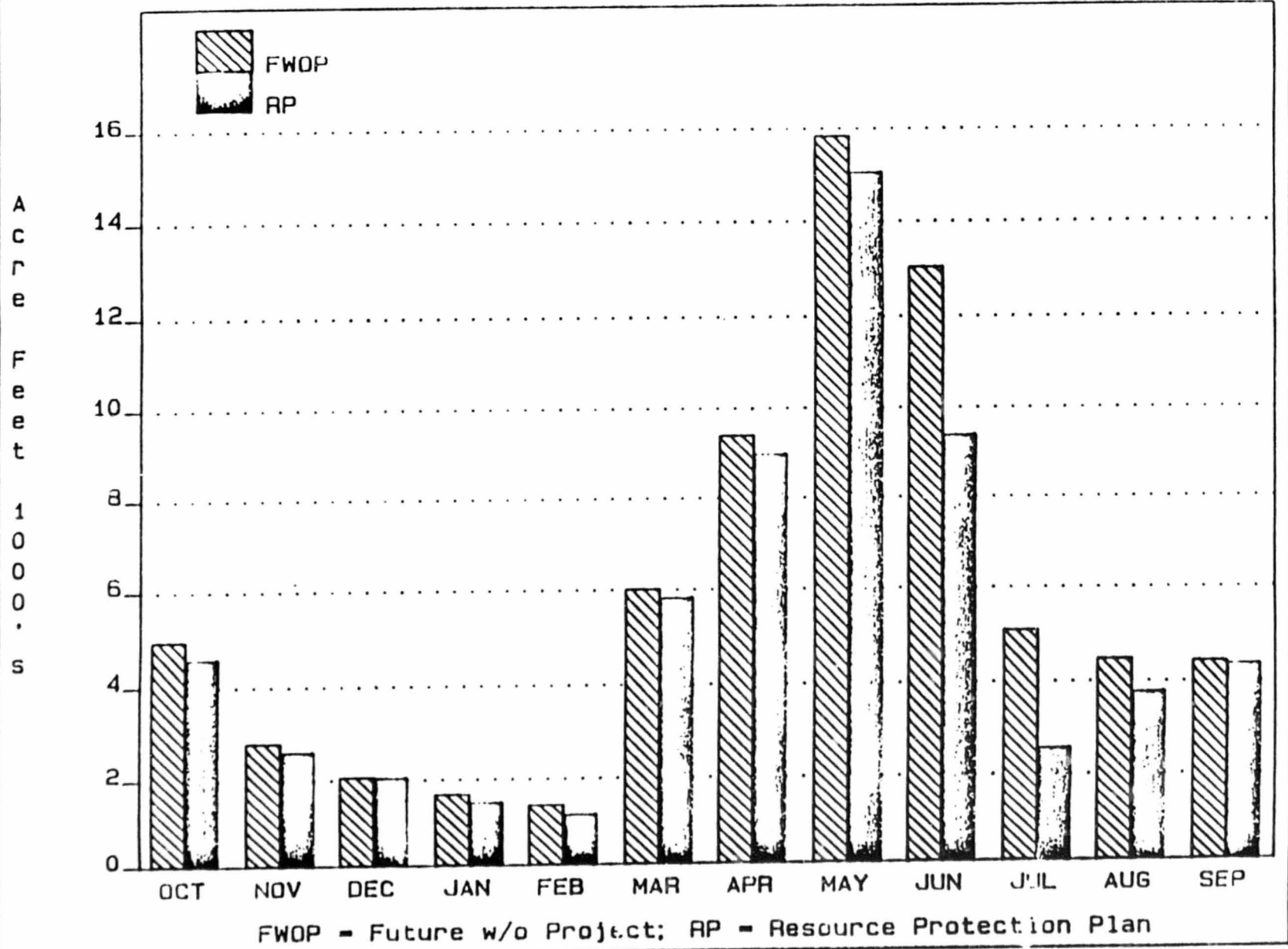
To obtain avg. daily cfs for a month, multiply the acre ft./mo
(expressed in 1000's) by 16.8.

1/ FWOP = Future without project

2/ RP = Resource Protection Plan, Combination of surface and sprinkler
irrigation systems to maximize salt load reduction to the
Colorado River.

3/ acft = Acre foot (feet) of water (1 acft = 43,560 cu.ft.)

PRICE RIVER (AVG. HYDROGRAPH)



17-Jan-91

TABLE 5
SAN RAFAEL RIVER - STREAM FLOW

Month (water year)	FWOP1/ (acft)4/ (1000's)	RP2/ (acft) (1000's)	Change Amt. (1000's)	Change %
OCT	4.32	3.74	-0.58	-13.4%
NOV	3.42	3.13	-0.29	-8.5%
DEC	2.36	2.34	-0.02	-0.8%
JAN	1.92	1.66	-0.26	-13.5%
FEB	2.99	2.73	-0.26	-8.7%
MAR	5.05	4.79	-0.26	-5.1%
APR	5.07	4.56	-0.51	-10.1%
MAY	11.71	10.67	-1.04	-8.9%
JUN	25.10	20.43	-4.67	-18.6%
JUL	10.39	6.38	-4.01	-38.6%
AUG	4.64	3.58	-1.06	-22.8%
SEP	4.03	3.72	-0.31	-7.7%
	-----	-----	-----	
TOTAL (AVG. ANNUAL)	81	67.73	-13.27	

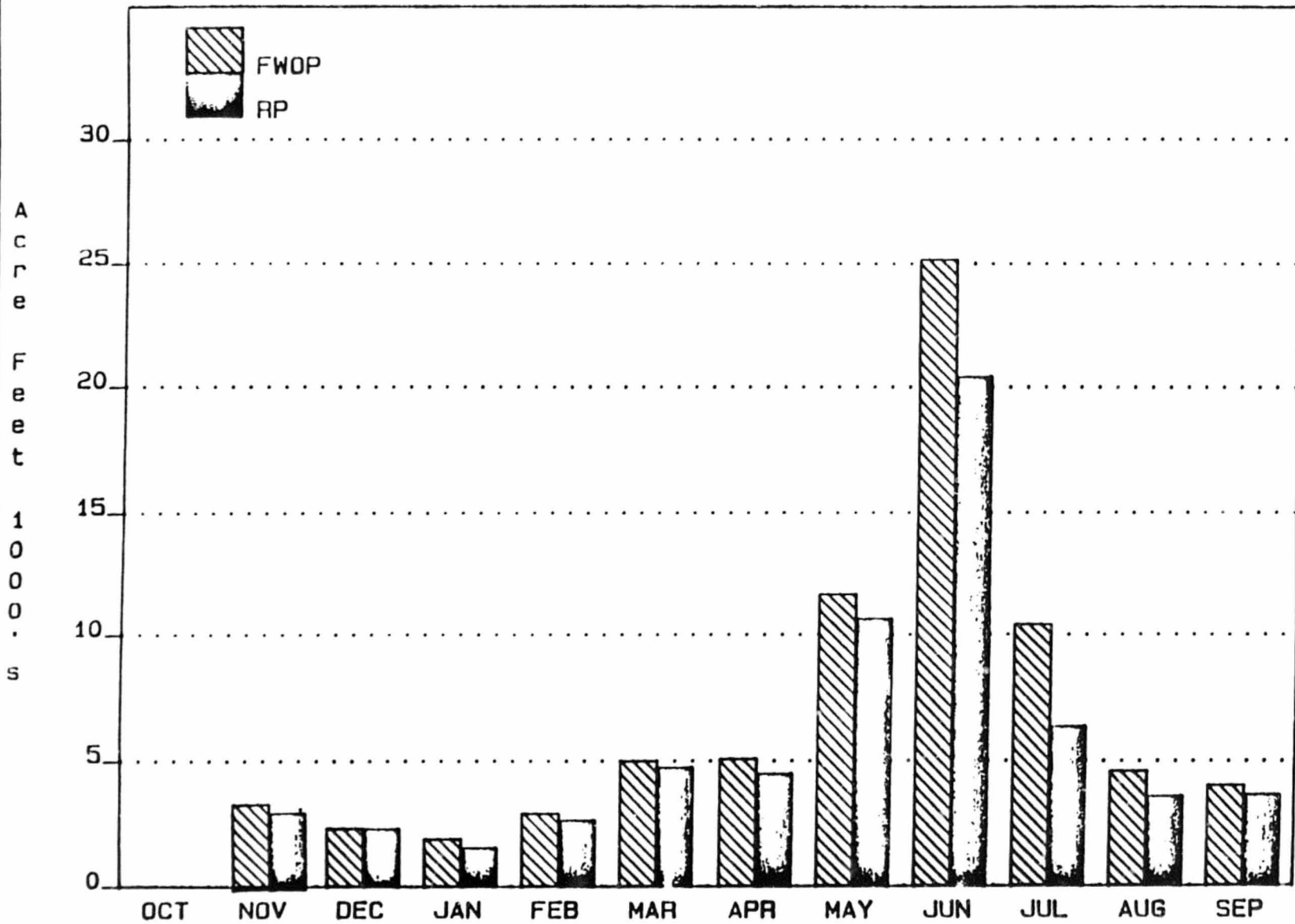
To obtain avg. daily cfs for a month, multiply the acre ft./mo
(expressed in 1000's) by 16.8.

1/ FWOP = Future without project

2/ RP = Resource Protection Plan, Combination of surface and sprinkler
irrigation systems to maximize salt load reduction to the
Colorado River.

3/ acft = Acre foot (feet) of water (1 acft = 43,560 cu. ft.)

SAN RAFAEL RIVER (AVG. HYDROGRAPH)



FWOP - Future w/o Project; RP - Resource Protection Plan

ATTACHMENT IX

Hydrosalinity Analysis

HYDROSALINITY ANALYSIS

PURPOSE

A spreadsheet program was developed to compute the salt load reduction from onfarm and off-farm improvements in Mancos shale derived soils. The program requires a salt pickup estimate derived from a regional water and salt budget.

The salt loading factor computed by the program can be used to evaluate the effectiveness of lining delivery systems and improvements in onfarm irrigation efficiencies. The salt loading factor (tons/acre-foot) is multiplied by the seepage reduction or deep percolation reduction to get an estimate of the tons of salt load reduction attributable to the improvements.

MAJOR ASSUMPTIONS

The program assumes that the ground-water outflow quality will not change with improvements in onfarm and off-farm efficiencies. This assumption is critical to the operation of the program. It has been shown that this assumption is reliably true in Mancos derived soils. It is hypothesized that the continuous weathering of Mancos shale provides a continuous source of salt.

Whatever the cause, the Bureau of Reclamation's (Reclamation) and the U.S. Department of Agriculture's experiences with Mancos derived soils show that this working assumption is valid. Reclamation specifically monitored the ground-water outflow water quality in Reed Wash in the Grand Valley Project, Colorado, for 8 years. Preproject and postproject monitoring showed that the outflow total dissolved solids (TDS) did not change with extensive onfarm and off-farm improvements. The only changes noted were that the outflow volume had been reduced and that the outflow tonnage of salt had also been reduced.

MINOR ASSUMPTIONS

As discussed in "Methodology for Future Conditions," the impact of the improvements on phreatophyte use was estimated by ratio to the water available to the phreatophytes.

For phreatophytes along ditches, laterals, and canals which undergo lining or piping, the ratio of reduction is 1 to 1. In other words, if the seepage were reduced by half by lining half the system, then phreatophytes and phreatophyte consumptive use associated with the delivery system would be reduced by a half. Ground-water phreatophyte use was estimated to be

reduced at a ratio of 0.5 for each part reduction in ground-water inflow. Tailwater phreatophyte consumptive use was estimated to be reduced at a rate of 0.25 percent for each percent reduction in tailwater flow.

METHODOLOGY FOR EXISTING CONDITIONS

This method assumes that certain water quality data have been gathered or estimated:

- Inflow TDS (milligrams per liter [mg/L]): This is the quality of the water diverted from the river and applied to the field.
- Ground-water Outflow TDS (mg/L): Winter measurements of drain outflow TDS are usually a fairly accurate estimate of the ground-water outflow TDS.
- Ground-water Pickup of Salt (tons): This number is estimated by use of a regional water and salt budget which accounts for the inflow and outflow of water and salt in a region or basin.

Basic to the logic of the program is the concept of mass balance or the conservation of mass. The central computation in the program is the mass balance of inflow and outflow for both salt and water. In other words, the sum of the inflows must equal the sum of outflows.

The ground-water inflows are: the onfarm deep percolation, the delivery system seepage, surface inflows like precipitation, and subsurface ground-water inflows. All of these inflows are either directly input or computed from other data entered into the spreadsheet.

The ground-water outflows are: subirrigation or reuse of drain water, phreatophyte consumptive use, surface and subsurface ground-water outflow, and possibly ground-water pumping. In the spreadsheet, two of these are considered as "unknowns." The program uses the ground-water outflow quality and the regional salt pickup to compute the ground-water outflow volume. The program also computes the phreatophyte consumptive use by mass balance of the inflows and outflows to the ground-water system. In other words, the water budget is "closed" on phreatophytes. This is done because there is no simple and accurate way to predict phreatophyte consumptive use since they can use from 1 to 7 feet of water per year. It is a good practice to check the phreatophyte acreage and assure that the use is reasonable, however.

METHODOLOGY FOR FUTURE CONDITIONS

The methodology for the computation of future conditions is identical to those used in computing the present conditions, with a few exceptions. Since the

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reduction in phreatophyte use in the future cannot be measured, it is estimated by ratio to the reduction in the available water to the phreatophytes. For example, the phreatophyte consumptive use from ground water is reduced by the ratio of present to future ground-water inflows. The delivery system phreatophyte consumptive use is similarly reduced by the reduction in seepage. The same is true of the onfarm phreatophyte use.

The resultant ground-water outflow volume is calculated by mass balance since all of the inflows and other outflows are "known." Since the outflow quality is assumed not to vary, it, too, is considered a "known." With these two "knowns," the future salt pickup (with some small adjustments for "by-passed" water) is the project effect in tons. Divide this number by the improvements (reductions in seepage and deep percolation in acre-feet) to get the loading factor (tons/acre-foot).

AUXILIARY COMPUTATIONS

Several computations in the program are made to compute the ground-water inflows and outflows, as well as Colorado River depletions.

The Farm Delivery Computation is carried down as input to the Onfarm Deep Percolation Computation which is then carried down to the ground-water inflow due to onfarm irrigation. Most of the detail required in these computations is used to estimate the Colorado River Depletion (acre-feet) and to account for tailwater use by phreatophytes and crops. One of the important features of the program is that it computes the concentration of salt by crop use. Thus, the deep percolation component enters the ground-water system with a higher TDS than the delivery system seepage. The delivery seepage is only concentrated by a small amount of phreatophyte use.

The Delivery System Ground-Water Inflow and Winter Water Ground-Water Inflow Components are separated due to their effects on phreatophytes. Winter water seepage is not available to phreatophytes during the growing season; thus, there is no phreatophyte use before the water enters the ground-water system. There is use from the ground water, but this is accounted for as a ground-water outflow component lower down on the accompanying spreadsheet.

On the spreadsheet, salt pickup (line 44) is the difference in the total tons column between no action and the Resource Protection plan.

Line 50 (seepage, winter water, and deep percolation reduction) is the total difference in the acre-feet of lines 32, 33, and 34.

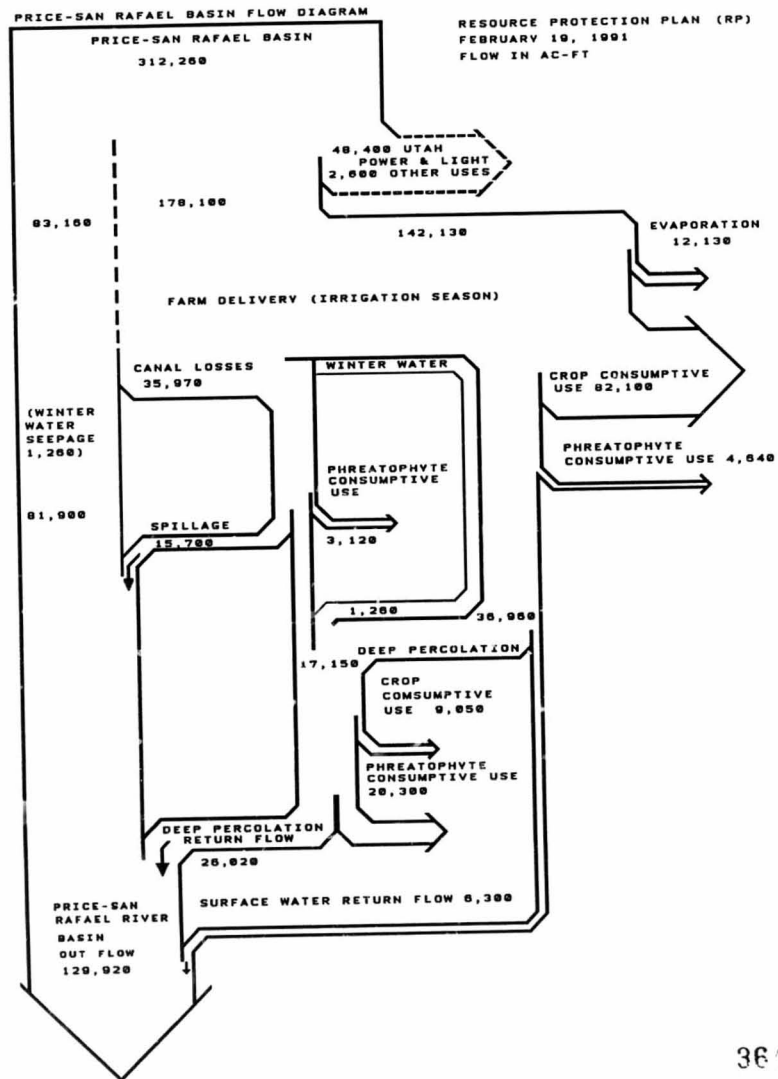
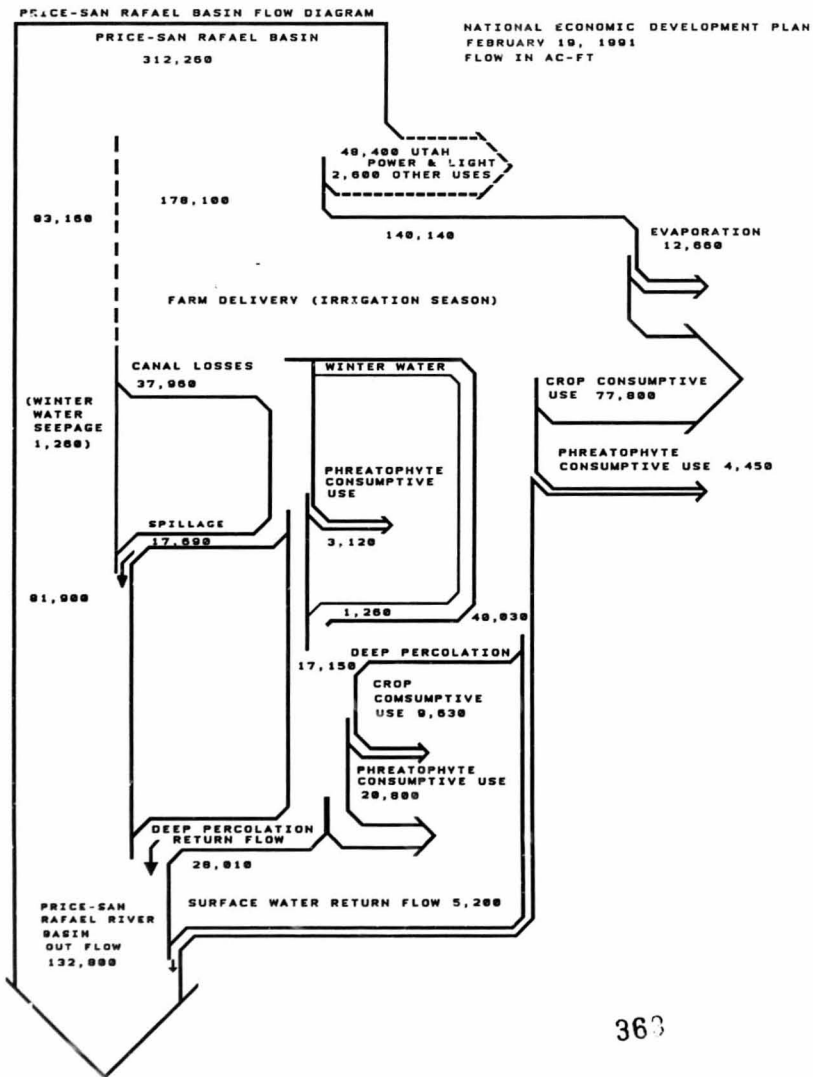
PRICE RIVER RESOURCE PROTECTION PLAN

	FWO af	RP af	mg/L	mg/L	tons	tons
3 Farm Delivery Computation (Irrigation Season Only)						
4 Diversion	93,200	93,200	260	260	32,956	32,956
5 Spillage	-11,468	-9,706	260	260	-4,055	-3,432
6 Delivery Seepage	-10,900	-9,980	260	260	-3,854	-3,529
7 Farm Delivery	70,832	73,514	260	260	25,046	25,995
8						
9 On-Farm Deep Perc Computation						
10 Farm Delivery	70,832	73,514	260	260	25,046	25,995
11 Tailwater	-2,167	-2,253	265	265	-781	-812
12 Irrigation Evaporation	-4,250	-6,627	0	0	0	0
13 Crop CU	-26,916	-40,495	0	0	0	0
14 Tailwater Crop CU	-637	-1,193	0	0	0	0
15 Tailwater Phreatophyte CU	-3,570	-3,605	0	0	0	0
16 On-Farm Deep Perc	33,292	19,341	536	957	24,265	25,183
17						
18 Delivery System GW Inflow Computation						
19 Delivery Sys Seepage	10,900	10,900	260	260	3,854	3,854
20 Delivery Sys Improvements		-920	260	260	0	-325
21 Phreatophyte CU	-1,900	-1,740	0	0	0	0
22 Delivery Sys GW Inflow	9,000	8,240	315	315	3,854	3,529
23						
24 Winter Water GW Inflow Computation						
25 Delivery Sys Seepage	3,200	3,200	260	260	1,132	1,132
26 Delivery Sys Improvements		-3,200	260	260	0	-1,132
27 Stock Pond Seepage	1,000	1,000	294	294	400	400
28 Stock Pond Improvements		-460	294	294	0	-184
29 Winter Water GW Inflow	4,200	540	268	294	1,531	216
30						
31 Ground Water Inflow Components						
32 On-Farm Deep Perc	33,292	19,341	536	957	24,265	25,183
33 Delivery Sys GW Inflow	9,000	8,240	315	315	3,854	3,529
34 Winter Water GW Inflow	4,200	540	268	294	1,531	216
35 Subsurface GW Inflow	0	0	0	0	0	0
36 Total	46,492	28,121	469	756c	29,651	28,928
37						
38 Ground Water Outflow Components						
39 Return Flow Crop CU	5,800	4,520	0	0	0	0
40 Computed Phreatophyte CU	19,593	15,722	0	0	0	0
41 Ground Water Outflow	21,099	7,879	5,250	5,250	150,651	56,259
42 Total	46,492	28,121			150,651	56,259
43						
44 Salt Pickup (tons)	121,000	27,331 tons				
45 GW Outflow Salt Load Reduction		93,669 tons				
46 Bypass Adjustment		-723 tons				
47						
48 Price River Basin Improvements						
49 Salt Load Reduction		92,945 tons				
50 Seepage, WW, and DP Reduction		18,531 af				
51 Loading Factor		5.0156 t/af				
52 Change in CU for CR Depletion		11,236 af				
53						
54 USBR Winter Water and Lateral Improvements						
55 Seepage Reduction		4,580 af				
56 Salt Load Reduction		22,971 tons				
57 Colorado River Depletion		1,691 af				
58						
59 USDA Mix						
60 Deep Percolation Reduction		13,951				
61 Salt Load Reduction		69,974				
62 Colorado River Depletion		9,545 af				

Note:
FWO indicates future without the
RP indicates Resource Protection Plan

SAN RAFAEL RIVER RESOURCE PROTECTION PLAN

	FWO af	RP af	mg/L	mg/L	tons	tons	
1							
2							
3	Farm Delivery Computation (Irrigation Season Only)						
4	84,900	84,900	260	260	30,021	30,021	
5	-8,327	-5,996	260	260	-2,944	-2,120	
6	-11,200	-10,290	260	260	-3,960	-3,639	
7	65,373	68,614	260	260	23,116	24,262	
8							
9	On-Farm Deep Perc Computation						
10	65,373	68,614	260	260	23,116	24,262	
11	-4,295	-4,016	265	265	-1,548	-1,447	
12	-1,961	-5,502	0	0	0	0	
13	-26,149	-39,886	0	0	0	0	
14	-471	-495	0	0	0	0	
15	-1,118	-1,100	0	0	0	0	
16	31,379	17,615	505	952	21,568	22,815	
17							
18	Delivery System GW Inflow Computation						
19	11,200	11,200	260	260	3,960	3,960	
20		-910	260	260	0	-322	
21	-1,500	-1,378	0	0	0	0	
22	9,700	8,912	300	300	3,960	3,639	
23							
24	Winter Water GW Inflow Computation						
25	3,800	3,800	260	260	1,344	1,344	
26		-3,800	260	260	0	-1,344	
27	900	900	294	294	360	360	
28		-180	294	294	0	-72	
29	4,700	720	267	294	1,704	288	
30							
31	Ground Water Inflow Components						
32	31,379	17,615	505	952	21,568	22,815	
33	9,700	8,912	300	300	3,960	3,639	
34	4,700	720	267	294	1,704	288	
35	0	0	0	0	0	0	
36	Total	45,779	27,247	437	722	27,232	26,741
37							
38	Ground Water Outflow Components						
39	6,458	4,530	0	0	0	0	
40	5,735	4,574	0	0	0	0	
41	33,586	18,143	3,289	3,289	150,232	81,154	
42	Total	45,779	27,247		150,232	81,154	
43							
44	123,000	54,413	tons				
45		68,587	tons				
46		-491	tons				
47							
48	San Rafael Basin Improvements						
49		68,096	tons				
50		18,654	af				
51		3.6506	t/af				
52		14,073	af				
53							
54	USBR Winter Water and Lateral Improvements						
55		4,890	af				
56		17,851	tons				
57		1,159	af				
58							
59	USDA Mix						
60		13,764					
61		50,245					
62		12,914	af				



6/23/91

Framework Plan for Monitoring and Evaluating
the
Colorado River Salinity Control Program

ATTACHMENT X

Framework Plan for Monitoring and Evaluating the
Colorado River Salinity Control Program

I. INTRODUCTION

Purpose and Intent of Monitoring and Evaluation

Monitoring and Evaluation (M&E) is an integral part of all SCS planning activities. In fact, M&E is equivalent to the follow-up element in conservation planning with individuals. In conservation planning, SCS revisits those practices and resource management systems that landowners have implemented to assure they are achieving the planned objectives and to determine whether the landowner needs further help in obtaining the effects we designed the system to accomplish. If conservation activities are not working well, follow-up enables us to identify the problem and change our recommendations in the future. If the activities are satisfactory, we reconfirm our knowledge and store the information for use in helping the next landowner who has a similar problem.

In this regard, the Colorado River Salinity Control (CRSC) Program is quite similar to traditional conservation planning. A main difference is that instead of being voluntary, the need for M&E in CRSC is mandated in the legislative authorities and specifically funded in the allowances. The Act (98 STAT 2933(D)) calls for the Secretary of Agriculture to "provide continuing technical assistance for irrigation water management as well as monitoring and evaluation of changes in salt contribution to the Colorado River to determine program effectiveness." This has been interpreted in §538.40 of the USDA National Manual for Cost-Share Programs to require that we 1) collect salinity control data; 2) evaluate the effect of salinity reduction practices on salt load reduction; and, 3) verify costs, project effectiveness, economic benefits, and impacts on wildlife habitat. It should be noted that monitoring wildlife habitat is also an agreed-to element of the EIS for each unit.

The U.S. Congress is interested in assuring itself that the CRSC is accomplishing it's objectives of salt load reduction in a cost effective manner. SCS, as an agency, is responsible for verifying salt load reduction, determining whether farmers and landowners receive sufficient onfarm benefits to offset the onfarm costs, whether we are achieving the level of "voluntary replacement of wildlife habitat" we projected during project planning, and, finally, whether the knowledge and experiences we've acquired in the early phase of CRSC can be transferred to other SCS water quality efforts.

State Conservationists receive their funding allowances for CRSC in three allocations: 1) an allocation to be applied to direct technical assistance (T/A); 2) an allocation to be applied to M&E; and 3) an allocation to support project planning. Because of differences in interpretation as to what constitutes either T/A or M&E, some states felt that they

received insufficient M&E funding to accomplish the demands that were placed upon them. This concern was reinforced by the fact that the M&E plans they prepared with West NTC assistance seemed inconsistent with the funding amounts received. To help clear up this problem, in the following sections, a definition is made of those activities that should be called T/A and provided as part of conservation planning, installation, and follow-up; and those activities that should be called monitoring and evaluation and undertaken as part of the additional, separately funded, M&E effort.

Activities that are Funded as
a Part of Technical Assistance

1. Implementating FIRM 1/, FIRS 2/, or other suitable systems, during follow-up with a landowner.
2. Evaluating wildlife habitat onfarm during planning and follow-up.
3. Collecting data for the Conservation Impact Worksheet (CIW) during planning and follow-up with a landowner.
4. Developing crop budgets.
5. Implementing and documenting IWM 3/ in planning, followup, and implementation technical assistance.

Activities that are Funded
as Part of M&E

1. Installing instruments and collecting irrigation data from instrumented sites.
2. Installing and/or monitoring wells.
3. Evaluating instrumented irrigation sites and well data.
4. Evaluating FIRM, FIRS, or other suitable systems information.
5. Evaluating deep percolation reduction and associated salt loading reduction.
6. Evaluating wildlife habitat or vegetative transects on non-contract lands to determine base conditions & with-project effects.
7. Monitoring wildlife habitat values on a project wide basis.
8. Evaluating CIW data.
9. Preparing individual M&E reports. Including the sections on salinity, economics, and wildlife. (The WNTC will prepare summary reports.)
10. Maintaining USGS gauging stations.
11. Evaluating water quality data.
12. Summarizing the analysis of changes in net farm income.
13. Summarizing regional and national economic impacts.

1/ FIRM - Farm Irrigation Rating Index

2/ FIRS - Farm Irrigation Rating System

3/ IWM - Irrigation Water Management

II. USDA M&E STRATEGY

Many local, state, and federal agencies are involved in the on-going basin-wide monitoring and evaluation effort in the Colorado River Basin. Numerous studies and data analyses have resulted in reports, publications, technical papers, and mathematical models. Measurements are made of both quantity and quality of water. The major thrust of their monitoring is to determine water quality or salinity concentration as water moves from their headwaters downstream. Data are evaluated to identify mechanisms causing water pollution and areas needing control, as well as to establish trends and project future salinity levels. Many agencies supply data and interpretations directly or indirectly to the salinity control program.

The USGS maintains a network of gauging stations on the main stem and tributaries of the Colorado River to measure water quality and quantity. Water quality data from 21 selected primary stations date back to 1926 with the majority of stations having substantially complete records since 1950. There are numerous water quality stations of local interest being monitored by USGS, USBR, and other federal, state, and local agencies. These local stations are, for the most part, used to identify the general magnitude of water quality during the year. The Colorado River Simulation System (CRSS) model developed by U.S. Bureau of Reclamation (USBR) is being used to monitor and forecast the effects of new water development and salinity control projects on water quality and quantity.

The USDA monitoring and evaluation strategy is described in this plan. Using estimates of deep percolation and seepage reductions from irrigation improvements and translating these into salt load reductions, it will provide acceptable evidence of basin-wide salinity impacts. Irrigation return flows from Grand Valley, Uinta Basin, Big Sandy, Lower Gunnison, Moapa, etc., currently add about one million tons of salt (12 percent) to the Colorado River. Surface irrigation return flows pick up an insignificant amount of salt. It is deep percolation and seepage of water through underlying salt laden formations which results in salt loading to the river.

Salinity changes result from improvement of irrigation systems and management of individual fields. The USDA approach to monitoring these changes involves the monitoring and evaluation of irrigation parameters. This information is then translated into salt load reduction. It is nearly impossible to isolate and monitor complex hydrologic subsystems for surface and subsurface inflow and outflow accurately enough over the long-term to directly measure the salinity impacts of specific measures being installed on scattered fields and farms throughout the salinity control units. USDA recognizes the monitoring activities and analyses being made of the system as a whole and for a few selected sites by U.S. Geological Survey (USGS), USBR, universities, and other state and federal agencies. USDA actively supports the basin-wide activity.

The underlying salt laden sub-strata essentially have an unlimited salt supply. Therefore, the subsurface return flows will continue to return to the river in the future at about the same concentration they do today. Each acre-foot of deep percolating water picks up salt while in transit to the river system. Salt pickup may vary from less than a ton to over 10 tones per acre foot. The return flow salinity concentration varies depending on which subarea is being considered. As irrigation systems or management are improved and less irrigation water seeps from ditches or percolated from fields into the underlying salt laden sub-strata, salt loading is reduced proportionally to the reduction in deep percolation and seepage.

The USDA monitoring plan is based on SCS's technical ability to estimate reductions in seepage and deep percolation that occur with irrigation improvement and translate these into salt load reductions.

III. HYDROSALINITY MONITORING AND EVALUATION

A. Activities that are Specifically Monitoring and Evaluation

As noted, onfarm deep percolation cannot be directly measured under field conditions. However, it can be estimated from a water budget that considers irrigation delivery, runoff, and irrigation-water management data. The evaluation process requires data on total inflow, outflow, crop evapotranspiration (ET), and soil moisture changes.

The hydrosalinity M&E program in each unit will normally consist of four parts: 1) the establishment of representative monitoring sites that will provide an opportunity to specifically measure effects of irrigation application, system improvements, and IWM practices implemented; 2) the collection of field data; 3) the analysis and interpretation of the field data; and, 4) recommendations for applying the interpretations. Monitoring information will be collected to quantify salt reduction from irrigation system improvements and IWM and to provide information to improve planning and application techniques. Throughout the monitoring process, sites may need to be moved to other fields/farms that will more nearly represent the area.

The hydrosalinity monitoring will, as appropriate to individual units, provide:

1. A collection of usable data on irrigation system improvements, number of irrigations, inflow, outflow, crop ET, soil moisture change, soil salinity, and IWM practices. Type of climatic data collection equipment and method of calculating ET will be based on local needs, budget, and available staff.
2. An opportunity to show the effects of both irrigation system improvements and IWM practices. Data can be used to train local SCS and Extension Service personnel.

3. Information on monitoring techniques and types of monitoring equipment.
4. FIRI, FIRS, or suitable program data at monitoring sites will be used to evaluate relative effects of irrigation system improvements and IWM practices that are applied. The evaluation may be made at the end of each year or whenever changes take place on the field.
5. An opportunity for a demonstration site to show local landowners and irrigators the effectiveness of conservation measures.

Periodically, the Land Treatment Programs Division (SCS, Washington, D.C.), the West National Technical Center, and the individual states will evaluate the number, location, and concentration of monitoring sites to consider adequacy as to the data being collected from any unit.

Monitoring of systems or methods of irrigation other than those specified for each "Unit" may also be included, as needed, to provide data for effects of all irrigation methods basin wide. Methods or systems that could be included are: drip/trickle, micro sprinkler, center pivot, lateral move, level basin, surge and cabling, and other new and innovative methods.

Precision and accuracy of the collection and analysis of the field data will be consistent with SCS standards.

Grand Valley, CO Unit - Surface Irrigation

A minimum of 10 to 12 representative sites will be utilized for the collection of instrumented or measured data on fields with furrow and corrugation irrigation systems in order to verify effects of irrigation improvements. The Grand Valley Unit will be the centralized effort in the CRSC Program for monitoring and evaluating the effects of improvements in surface irrigation. A limited number of other irrigation methods will also be monitored.

Data collected at the sites will include, but not be limited to:

Number, duration, and frequency of all irrigations; inflow; surface outflow; soil moisture change; calculated crop ET; soil salinity; and IWM.

Uinta Basin, UT Unit - Sprinkler Irrigation

A minimum of 12 representative sites will be evaluated for collection of detailed data on sprinkler irrigation systems to verify effects of irrigation improvements. The Uinta Basin will be the centralized effort in the CRSC Program for monitoring and evaluating the effects of conversion from surface to sprinkler irrigation.

Data collected at the sites will include but not be limited to:

Number, duration, and frequency of all irrigations; inflow; surface runoff; soil moisture change; evaporation and wind drift losses (estimated); calculated crop ET; and IWM. This will also include "catch can evaluations" each year to verify irrigation applications.

McElmo Creek, CO Unit - Sprinkler Irrigation

A minimum of 5 sites will be evaluated for collection of detailed data on sprinkler systems in order to identify localized effects.

Data collected at each site will be the same intensity as for Uinta Basin.

Lower Gunnison, CO Unit - Surface Irrigation

A minimum of 5 sites will be evaluated for collection of detailed data on surface systems to identify localized effects.

Data collected at each site will be at the same intensity as for Grand Valley.

Big Sandy, WY Unit - Sprinkler Irrigation

System improvements will be evaluated using the FIRS method on all sprinkler irrigation systems installed to determine the level of irrigation water management obtained by the farmers. Field verification of calculations by the FIRS method will be done by periodic field evaluations of representative sprinkler systems.

Moapa Valley, NV Unit - Surface Irrigation

A minimum of 5 sites (border and furrow combined) will be evaluated for collection of detailed data on surface irrigation systems to verify local conditions.

Data collection intensity at each site will be the same as for furrow systems in Grand Valley.

B. Activities Conducted as Part of Technical Assistance

Evaluations using FIRI, FIRS, or other suitable programs will be done on all contracts during the follow-up (for IWM documentation) and to record effects due to the changes of irrigation system improvements and IWM practices that are being applied.

IV. WILDLIFE HABITAT MONITORING AND EVALUATION

A. Activities Conducted as Part of Technical Assistance

1. Wildlife habitat evaluations will be done as part of the normal planning and follow-up process on all contract farms. Baseline conditions will be determined during the resource inventory phase of planning. As alternatives are developed, with the landowner, the potential changes in habitat values will be determined. Wildlife practices will also be evaluated to show the landowner the value of installing those

practices on his/her contract unit. The owner can then make practice selection decisions with knowledge of the impacts to fish and wildlife habitat.

2. Followup evaluations should be done immediately after installation to capture short term impacts, then every 3-5 years or to the end of the LTC contract. This is done to evaluate the actual impacts of plan installations and to compare them to projections made during planning. This will either confirm the projected impacts or assist in fine-tuning our impact estimates during future planning.

B. Activities that are Specifically Monitoring and Evaluation

1. Wildlife habitat data recorded will be summarized by habitat values or type for each evaluation species. Changes in habitat values from base condition to with-project condition will be by on-farm areas, off-farm areas, and total unit.
2. Evaluation of the summarized data should determine the overall trend of impacts (habitat values or habitat suitability indexes) on the various habitat types and evaluation species. The evaluation will answer such questions as: What were the impacts on wildlife habitat? Was there a difference in impacts on onfarm and off-farm areas? What wildlife practices best replace lost values in terms of in-kind values?
3. Transects will be established off-site when there is reason to believe there will be impacts on habitats on non-contract lands. These transects will be used to establish baseline conditions and estimate off-site impacts as a result of project installation. These should also be evaluated approximately every three years until the unit implementation is completed. Transect information could be obtained through the use of aerial photography.
4. Fisheries and other items will be monitored and evaluated consistent with individual project M&E plans/EISs.

V. ECONOMICS MONITORING AND EVALUATION

Reduction in Colorado salinity levels achieved by treatment of irrigated land in the Basin causes economic impacts to users of the land, residents of the region, and the nation in both the short and long term. Economic effects experienced by users of treated land are an important first-level determinant.

A. Activities Conducted as a Part of Technical Assistance

Onfarm economic effects will be based on the change in annual net farm income using partial budgeting procedures. Basic data will be collected as an integral part of the planning process by field staff using the conservation impact worksheets (CIW). These

worksheets will be filled out for at least 25 percent of all salinity control plans prepared. A more detailed form will collect data on the same farms that are being monitored for irrigation activities during the same years.

CIWs will record the following types of information on a conservation planning unit basis: crop, yield, type and number of production practices, amount of production inputs such as conservation practices, management practices, number of irrigations, cost of water, labor, etc. During the initial planning stages, this information will be recorded for the base conditions (i.e., what the farmer is doing before receiving any assistance). To the extent possible, the conservation planner will then project changes in these same data resulting from implementing the planned conservation system (i.e., the after-assistance option). This will provide the participant with the information needed for decisionmaking.

At the time of the final contract status review, additional information will be obtained. This will be a review of the projected after-assistance information, correction of that data where necessary, and a filling in of the data not collected or projected earlier (e.g., achieved yields). When the contract expires, an analysis of the changes between base condition and the conservation option will be completed, and summaries of these results developed for use in the annual M&E report.

Program managers in each of the salinity control units will assure that conservation impacts data is collected from an adequate number of representatives of each of the dominant combinations of resource situation and treatment options. Since change in net farm income is dependent on (at least) soil productivity, farm size, type of irrigation system, and crop, data will need to be collected for each of the dominant combinations of these four variables. For example, soils may be grouped by production potential. Farm size could include: full-time commercial farms, part-time commercial farms, and part-time hobby farms. Methods of irrigation will be divided between sprinkler and surface and may be further divided; i.e., drip, center-pivot, side-roll, and handline for the sprinklers; furrow, graded borders, and contour ditch for the surface systems.

Although changes between the base condition and the conservation option are valuable and useful data for working with farmer, these data must be further translated into changes in net farm income to satisfy the project M&E goals. A second level of detail would involve an economist (or other trained individual) to develop crop budgets for the more common crop enterprises. These data will be developed from a set of intensively monitored farm operations (likely 3-5 farms) within each salinity control unit. The crop budgets will be standardized to the total unit by using the information collected on the monitored farms.

B. Activities that are Specifically Monitoring and Evaluation

Economic analysis will determine for each dominant resource and treatment situation, the estimated changes in net farm income associated with the salinity control systems installed. These analyses will include estimates of investment in treatment, production costs, and

production outputs. Summaries of these estimates will also be included in the annual M&E reports.

Differences in the relative federal cost effectiveness and local cost effectiveness of the various salinity control systems will be determined through these analyses and may provide guidance to project management regarding opportunity for profitable concentration of effort.

As a third level economics M&E activity, estimates will be made of the regional impact of each salinity unit's accomplishments for use in the 5 year report. This will likely involve the use of input-output procedures to estimate the level of regional economic activity generated by the federal and non-federal expenditures directly caused by the unit activities. The multipliers will be supplied by the WNTC.

VI. U.S. GEOLOGICAL SURVEY WATER QUALITY SAMPLING PROGRAM

The mission of the USGS is to provide information about and interpretative appraisals of the Nation's water resources. The Water Resources Division personnel, through a District Office located in each basin state, maintains and develops cooperative hydrologic investigations with state, local, and federal agencies. These investigations, typically more local in scope, compliment the regional and national investigations and research by USGS federal funds. Since USGS programs are developed and managed on a state-by-state basis, contacts for assistance or information are also at the state level. SCS staff in each state should maintain liaison with USGS to coordinate needed monitoring.

VII. M&E REPORT

An annual report will be prepared for each salinity unit at the end of each irrigation season and submitted to the Director, Land Treatment Program Division, SCS, Washington, D.C., by April 1. All collected data will be analyzed and interpreted to: 1) make recommendations to improve monitoring techniques; 2) provide feedback to field offices to improve planning and application techniques; and, 3) may provide data on the effects to other salinity units. The attached M&E report format will be used for consistent reporting of M&E findings. The WNTC will combine M&E reports from each unit into a brief (2 to 3 pages) report summarizing program cumulative impacts.

A summary cumulative M&E report will be prepared by the WNTC every five years. The date for completing the first five year report on Grand Valley, Uinta Basin, Lower Gunnison, Big Sandy, McElmo Creek, and Moapa Valley is February 1, 1993. States will provide the necessary data to the WNTC by December 1, 1992.

Partial irrigation budgets will be developed for the monitored sites. The results of detailed monitoring and other irrigation evaluations of irrigation sites will be used to verify water

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budgets used in planning and final reports. If significant adjustments (i.e., greater than 10%) in original irrigation budgets are required, an update of deep percolation estimates will be made to estimate salt load reductions and published in the five year summary report as necessary to identify the on-farm effects.

The annual summary M&E report will include an analysis of the effectiveness of salinity control program measures to reduce salt loading. It should also answer such questions as: What changes in systems being applied could reduce the impacts on wildlife habitat? Is there a need for more emphasis or cost-share for wildlife practices? Could a change in emphasis or priority lead to more salinity reduction per dollar spent? And finally, are there trends in the data that indicate a need for modification of the program or planning process to achieve the goals of the salinity program? For consistency, the report format to be used is attached.

I. INTRODUCTION

1. Overview and Methodology - Explain why we are monitoring economics, hydrosalinity and wildlife effects.

Generally describe the monitoring and evaluation in this salinity unit. Include such items as unit location, when started, the type of information collected, size of farms and fields, average size of farms and fields, etc.

2. Setting

- a) Describe the onfarm and delivery systems.
- b) Describe the monitoring sites. Include the number and location that were monitored. Describe the irrigation system and how the monitoring was accomplished. Include all pertinent descriptive information that makes the monitoring site unique (soils, slope, etc.).

3. Climatic conditions - This is where weather conditions which are needed to understand the data are explained. A good example is: long-term drought may be drying up all the wetlands independently of the program. Any such explanation should be for the current and past years and should include how climatic conditions have affected the crops and the crop yields in the unit area.

4. Objectives - discuss the objectives of the M&E program in the salinity unit. Cover each of the major parts of the report, i.e., hydro-salinity, wildlife habitat, and economics and what use will be made of the data collected.

5. Scope and status of CRSC program implementation. Although this information is included in the project managers report for each salinity unit, it is necessary to include the information here for this document to be complete. Therefore, create a table to include the following:

<u>Current</u> <u>YEAR</u>	<u>Cumulative</u> <u>of prev. years</u>
-------------------------------	--

- a) funding (TA & FA)
- b) acres treated
- c) no. contracts

- d) CRSC cost shared practices instl.
(list acres by practice name)
- e) CRSC non-cost shared practices instl.
(list acres by practice name)
- f) wildlife habitat created (ac. by type) or (values by type)

II. HYDRO-SALINITY MONITORING AND EVALUATION

1. Summary of stream gauging data
2. Irrigation monitoring and evaluation
 - a) summary of the monitoring site data
 - b) summary of field evaluations
 - c) summary of water budgets
 - d) trends
 - e) irrigation adequacies at sites
 - IWM practices
3. Well Data (if there are any)
4. Water and salt budgets
 - a) reduction in salt loading
 - b) reduction in deep percolation & seepage
5. Recommendations - include a short discussion of the monitored sites. List changes (if any) that need to be made as a result of the M&E data.
 - equipment and staffing
 - planning and design of irrigation system changes.
 - limitations and concerns
 - (raw data should be placed in the appendix)
6. Appendix (to be located at the end of the report)
 - field evaluation data
 - individual seasonal records of water delivery

III. WILDLIFE HABITAT MONITORING AND EVALUATION

1. Setting - What specific habitats are of concern in the local area, how are they being used (managed), etc. What animal species are dependent on the habitats?

2. Methodology - Explain how the sampling design was set-up, whether all on-farm or some random transects. Explain frequency of data collection. What system is being used (HEP?), etc.? How is data recorded, compiled, averaged, etc.?
3. Results - This should be the main focus of this chapter.

- a. Summary tables - These should show summary HSI values for each evaluation species, habitat changes in acres, etc. This is where we attempt to show the sum of individual contract effects of the program to date. There may be a column for the reporting year, a column for all combined past years, and a column for the new combined total.
- b. Effects of practices or systems table - This is where we tie the summary table data in A (above) to the systems and practices which produced the impacts. These could be in table form as well. For example.

System installed	Avg. change in habitat (-)/(+)	Change in HSI by eval. species
Improved Flood Irr.	-2.2 Mi. ditchbank	-.2 Dove
Side roll sprinkler	-12.0 Ac. Type II Wetland	-.3 Duck

- c. Narratives - These should be used to interpret Tables in A&B and present conclusions.
4. Recommendations - This is where the Field Office (and others) can suggest ways to improve the program, delivery, participation, effects, etc., based on the M&E data taken to date and with their knowledge of the local landowners and conditions.
5. Appendix - Tables of Field Data (to be located at the end of the report) - If necessary to be included, here is where all individual contract M&E data collected should be reported in tabular form.

Example:

<u>Contract</u>	<u>Inventory HSI</u>	<u>Habitat Inventory Ac.</u>	<u>Planned/ Future with HSI & AC</u>
3	Deer .71	22	.64 20
	Duck .32	34	.20 12
	Dove .51	100	.70 113

The last column (Planned/Future with HSI & AC) is to be repeated each time the contact or transect is reevaluated (every 3 years, etc.).

IV. ECONOMICS MONITORING AND EVALUATION

1. Setting - describe the field and farm the sample was taken from. CIW's are to be taken on at least 25% of all contracts, on one or two fields of the farm, and intended to represent the farm and the unit area.
2. Methodology - Explain how the sampling design was set up (if CIW's were not taken on all contracts), numbers of CIW's or other inventories taken, and other supplementary data used to add credence to the overall effects of the installed measures.
3. Changes in Ag. Production Items - On the monitored irrigation sites, list changes by year in the following items. Report by hay crop or pasture, row crop and orchards. Use a more detailed breakdown if necessary:

<u>Item</u>	<u>Unit</u>	<u>Current Year</u>	<u>Cumulative of prev. years</u>	<u>Cumulative Avg. of prev. years</u>	<u>Percent Change 1/</u>
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- fertilizer
- yields
- labor
- water cost
- practice cost
- effects on salt (reduction)
- chemical use
- acres interviewed (ac. Irr.)
- ave. yield by crop
- total output by crop
- income - include as a line item, reductions in the cost of the field irrigation and delivery system.
- decrease machinery use (list machine)
- other crop inputs
- irr. O&M changes 2/
- machinery
- materials

1/ Current year - cumulative average of previous years - 100

2/ This is labor spent in maintaining the field irrigation and delivery system. It includes time spent cutting weeds and/or brush, fighting breakouts, cutting ditches, controlling water, changing sets, etc. Report in hours/ac/season.

The changes in effects obtained from data collected will be expanded to entire area. The 5-year report will discuss the total impact from each of the salinity units. This information will give the reader the magnitude of the overall program impact in the salinity area.

4. Summary and Recommendations - Summary of the economic effects of the measures installed during the year of this report, recommendations, etc.
5. Problems to be addressed in future economic monitoring and evaluation activities.
6. Appendix

ATTACHMENT XI

Comments and Responses on the Planning Report/Draft Environmental Impact Statement

ATTACHMENT XI

INTRODUCTION

This Planning Report/Draft Environmental Impact Statement (DEIS) was filed with the Environmental Protection Agency (EPA) on September 23, 1991. Public hearings on the draft were held on November 12, 1991, in Price, Utah, and November 13, 1991, in Castle Dale, Utah. The period in which comments on the document were received ended on February 23, 1991.

The availability of the draft document and the public hearing schedule were published in the *Federal Register* and in local and regional newspapers. A number of written comments were submitted and oral presentations made in the public hearings.

Presented below is a list of those who commented at public hearings, and then those who submitted written communication on the DEIS. Following the list of names are oral and written comments; those that addressed the same points were combined into issues, as in "Issue 1," followed by the names of individual(s) or organization(s) raising the issue, and then by the response to that issue. The exception to this format is found in the initial part of the comments/response section, which includes answers to issues raised by the EPA and U.S. Fish and Wildlife Service (Service). Because these entities were collaborating agencies with the Bureau of Reclamation (Reclamation) and the Soil Conservation Service on this Planning Report/DEIS, issues raised in their correspondence have been responded to point by point. All letters were, however, answered in full or in summary fashion.

After the comments/responses section are attached the full letters from individuals and entities concerning the DEIS; transcripts of the public hearings are available at Reclamation's Provo Projects Office but are not attached to this document.

Public Hearing, Price, Utah

Larry Anderson	Paula Butcher
Jack Barnett	Lyle Bryner
Verdis Barker	Boyd Marsing
Dale Mathis	Jack Soper
Ken Phippen	Lyle Bryner
Jack Soper	

Public Hearing, Castle Dale, Utah

Brad Johnson	Clyde Magnusen
Larry Anderson	Darrell Leamaster
Jack Barnett	Tracy Behling
Perry Bunderson	Montell Seely
Jay Humphrey	Grant Wilson
Ross Huntington	Sherill Ward
Reed Murray	Eugene Johnson
Gale Jorgensen	Cortney Guyman

Federal Agencies

Environmental Protection Agency, Region VIII, February 27, 1992.
Fish and Wildlife Service, Utah State Office, March 20, 1992, and March 22, 1993.
U.S. Department of Agriculture, ASCS, Emery-Carbon County Office, November 12, 1991, and January 17, 1992.
Bureau of Land Management, Price, Utah, January 22, 1992.

State Agencies

Utah/USDA Cooperative Extension Service, Carbon County (public hearing statement, Jack Soper, county agent).
Utah Office of Planning and Budget, Resource Development Coordinating Committee, December 20, 1991, and January 27, 1992.
Utah Division of Water Resources, November 12, 1991.
Colorado River Basin Salinity Control Forum (consists of governors or governors' representatives from the seven Western States of the Upper and Lower Basins of the Colorado River), November 1991.
Utah Department of Natural Resources, Division of Water Rights, January 23, 1992.

Local and Private Agencies and Organizations

Southern Utah Wilderness Alliance (SUWA), December 23, 1991.
Utah Farm Bureau Federation, January 31, 1992.
Castle Valley Special Service District, November 13, 1991.
Carbon County Commission, November 12, 1991.
Castleland Resource Conservation and Development Council Inc., January 16, 1992.
Ferron Canal & Reservoir Co., November 2, 1991.
Stowell Irrigation Co., December 18, 1991.
Stowell Ditch Co., December 18, 1991, and January 7, 1992.
Wellington Canal Co., January 21, 1992.

Orangeville City, November 21, 1991.
Huntington-Cleveland Irrigation Co., January 24, 1992.
Carbon Canal Co., January 16, 1992.
Price-Wellington Canal Control Board, January 16, 1992.
Price River Watershed Soil Conservation District, January 17, 1992.
Price River Distribution System, January 17, 1992.
Spring Glen Canal Co., December 18, 1991.
Utah Power & Light Co., February 25, 1992.
San Rafael Soil Conservation District, January 18, 1992.
Emery Water Conservancy District, January 20, 1992.
Cottonwood Creek Consolidated Irrigation Co. (undated).

Individuals

Montell Seely, November 13, 1991, and January 22, 1992.
Gale Jorgenson (undated public hearing comment).
Ross C. Huntington, January 21, 1992.
Clyde J. Magnusen, January 20, 1992.

RESPONSES TO THE EPA AND SERVICE

The following are responses by the Bureau of Reclamation (Reclamation) and the U.S. Department of Agriculture (USDA) to the Environmental Protection Agency's (EPA) letter of February 24, 1992, and to the Fish and Wildlife Service (Service). The responses identified concerns regarding the magnitude of projected wetland losses, adequacy of impact disclosure and the range of action alternatives in the draft environmental impact statement (DEIS) for the Price-San Rafael Rivers Unit, Colorado River Salinity Control Program.

RESPONSE TO EPA LETTER

We feel that the enclosed comments, along with revisions and additions to the DEIS will meet EPA's concerns as stated in the February 24, 1992, letter and in subsequent meetings.

1. Reclamation is committed to replace wildlife habitat and fund the endangered fishes recovery program for the Reclamation portion of the project, as described in the DEIS.

The original idea that Reclamation would "backstop" Soil Conservation Service (SCS) wetland replacement has been found infeasible. Instead, SCS would "backstop" its own program. The following statement will be included in Environmental Commitments, an attachment to the final environmental impact statement (FEIS):

"USDA believes that voluntary habitat replacement within the Colorado River Basin Salinity Control Program will be successful in replacing wildlife values foregone within the Price-San Rafael Salinity Unit. However, if monitoring indicates trends of lost wildlife values, USDA will seek additional funding authority to assure replacement of these values."

The goal of USDA is replacement of all wildlife (both wetland and upland) habitat values lost as a result of the project. USDA has been specifically authorized and directed by Congress to implement a voluntary wildlife habitat replacement program that recognizes the values foregone by project implementation. In order to achieve the goal of replacement of all habitat values through a voluntary program, USDA would give specific attention to wildlife habitat during the planning process with individual landowners as detailed in Chapter IV, *Fish and Wildlife Habitat Replacement*. USDA would also carry out the following monitoring activities, work with the Local Salinity Coordinating Committee (LSCC) to facilitate habitat replacement, and, finally, would implement the backstopping procedure, if necessary.

Monitoring would be included in the planning process. As each individual salinity control plan is written, expected loss of wetland habitat and planned replacement of habitat values would be tracked by acres, wetland type, and habitat value. These figures would be accumulated and published annually. If it was found that replacement of wildlife habitat values was not keeping pace with loss of values, USDA would encourage the LSCC to take one of the

following actions: (1) adjust the priority rating system to give higher priority to wildlife habitat replacement, (2) set aside a certain amount of the cost-share funds for wildlife-only practices, and (3) request a higher cost-share rate from the Deputy Administrator, Agricultural Stabilization and Conservation Service. (The law states that this rate can be raised if the 70-percent rate is not successful in replacing "incidental fish and wildlife values foregone.")

If, after 5 years, monitoring indicated a trend of lost wildlife values, USDA would seek additional funding authority to assure replacement of these values. This authority might include offering cost sharing for replacement of wetland outside of the Price and San Rafael Basins. This action would require a change in USDA Colorado River Salinity Control (CRSC) Program Interim Rules.

2. The "worst-case" estimate of conversion of wetland to nonwetland resulting from the preferred alternative has been reduced to 5,621 acres as a result of correction of a math error. Since this is a "worst-case" estimate, the actual losses are expected to be less. As a comparison, a more likely estimate will also be provided in the FEIS.

The 49 acres of "ponds/wetlands" was not a "wetland replacement target" but a minimum estimate (consistent with the worst-case analysis) of the acreage of ponds to be constructed by landowners. Since this figure has caused confusion, the specific amounts used for cost estimation will be removed from the document. The actual amount of wetland replacement or enhancement cannot be determined until the landowner makes application for program assistance. There are a variety of wildlife habitat practices including ponds and wetlands that will be applied to replace habitat values lost. A list of practices is included in Chapter IV, in the *Wetland/Upland Wildlife Conservation Practices* section.

Additional initiatives to reduce impacts and/or expand the wetland replacement program suggested by the EPA in their comment letter on the DEIS are discussed below:

(1) "Offering the public the opportunity to retire lands from agricultural production on a piecemeal basis and manage the retired land for wildlife." Problems with this initiative are: lack of compensation for the landowner and inconsistency with the goals of the program.

SCS can suggest retirement as an implementation alternative, but retiring land from agricultural production can be accomplished only if the landowner is willing to forego agricultural income or some private organization is willing to provide compensation. No funds are available through USDA to purchase land or easements on land to compensate owners for loss of agricultural production. The Wetland Reserve Program set up by the Food, Agriculture Conservation and Trade Act of 1990 compensates owners for easement on natural wetlands but not on artificial wetlands. At the present time, the Wetland Reserve Program is not available in Utah. If this program becomes available for all landowners in the State, USDA personnel will make all landowners in the basins aware of this potential for obtaining compensation by protecting natural wetlands. However, to utilize this program on artificial wetlands such as those expected to be impacted by this project, the law would need to be changed.

SCS is participating in a Private Lands Wildlife Initiative Committee with wildlife organizations and State and Federal agencies to promote wildlife habitat improvements on private land. Within this group, SCS is seeking to identify any other entity that might be willing to purchase land or easements for wetland habitat. There are physical limitations to implementing the land retirement initiative. Areas that have the most irrigation-induced wetlands and extensive areas of irrigation-supported upland vegetation are the result of severe canal seepage and very inefficient application of irrigation water, and are the greatest contributors of salt to the river system. Retiring these lands and managing them for wetland habitat using the same amount of water as is now used for irrigation, possibly concentrating it in one area and ponding it to create shallow marshes, would be counter to the objective of this program because salt loading would not be decreased.

Retiring these lands and using 20 percent of the water to maintain existing vegetation would reduce salt loading somewhat but would leave 80 percent of the water to be used elsewhere. As stated in Chapter IV, *Retirement of Land From Irrigation*, potential industrial users have no concrete plans to develop facilities that could make use of this water. Agricultural uses downstream from retired land would only transfer the problem to another area because of unfulfilled water rights in these two river basins.

(2) "Targeting specific areas for wildlife purposes rather than for salinity control." If SCS targets areas that have the most irrigation-induced wetland for wildlife purposes rather than salinity control, it would thwart the objective of the program. SCS can and will make an effort to interest landowners in flood plains associated with perennial streams in wildlife practices (as stated in the *Private Land Opportunities* section) even if they are not eligible for salinity control practices.

Cost sharing is available to landowners who are not otherwise participating in the salinity control program to install wildlife habitat. Specific reference to the opportunity for wildlife-only plans has been inserted in the EIS in Chapter IV, *Resource Protection Plan, Fish and Wildlife Habitat Replacement*.

(3) "Enhancement of wetlands including Federal lands." Enhancement of privately owned wetlands is part of the USDA wildlife habitat replacement program. Enhancement is currently being carried out in the Uinta Basin Unit (1,000 acres of wetland have been improved) and would be pursued in the Price-San Rafael Unit. A reference to enhancement has been added to Section IV, *Resource Protection Plan, Fish and Wildlife Replacement, Onfarm Measures*. SCS would encourage Federal agencies to enhance federally owned wetlands. However, no salinity funds can be spent on Federal lands under the existing authority. Salinity funds can be spent on State lands to share the cost of development or enhancement of wetlands.

(4) "Off-site replacement."—Replacement of wildlife habitat on land without salinity control practices has been covered under Response 2, above. Use of salinity cost-share funds outside the project boundaries would require a change in USDA CRSC Program Final Rules. This could be pursued under the backstopping commitment.

(5) "Development of wetland replacement and protection opportunities that may exist through working with public and private landholders and agencies."—Wetland replacement with public and private landholders is detailed in the EIS under *Fish and Wildlife Habitat Replacement*. SCS would not detail other agencies' programs. SCS would work with any other agency or organization to inform the landowners that there are other programs available. SCS is a member of the Private Lands Initiative Committee (along with other Federal and State agencies and private organizations). The committee is publishing a reference list of wildlife/wetland assistance (technical and/or financial) available to the private landowner. As the project was implemented, all opportunities available at the time would be explored.

Other initiatives that have been suggested are: Increase the cost-share rate and target a specific dollar amount to wildlife. As stated above, the LSCC can recommend an increase in the cost-share rate and can target funds for wildlife habitat.

3. The range of action alternatives has not been changed. These alternatives meet the need as stated, "salinity control on the Colorado River system." The National Environmental Policy Act (NEPA) 40 CFR 1502.13 states that alternatives should be proposed to meet the underlying need.

The preferred alternative has been revised to specifically address recommendations to the LSCC, feasible initiatives, and the backstopping commitment, all of which are designed to increase voluntary replacement of wildlife habitat. These items will be included in the Environmental Commitments attachment or in Chapter IV, *Resource Protection Alternative, Fish & Wildlife Habitat Replacement*.

The DEIS discusses Reclamation's plans for mitigating off-farm impacts to the environment resulting from the proposed project.

4. Additional information on expected impacts to wildlife has been added as requested in the detailed comments, and areas of disagreement with the Fish and Wildlife Coordination Report have been addressed.

5. The Framework Plan for Monitoring and Evaluating the CRSC Program will be included as an attachment to the FEIS. Methodology for tracking wetland types, acres, and habitat values lost and gained is included in the Framework Plan. The commitment to using an appropriate species model (developed by an interagency team) for each wetland type has been added to Chapter IV, *Monitoring and Evaluation*. It is not feasible to set up a schedule for interagency concurrence at this time. However, the Monitoring and Evaluation Plan for the Price-San Rafael River Unit would be developed by SCS in consultation with other agencies prior to the implementation of any onfarm contracts.

6. The Fish and Wildlife Service (Service) and USDA have agreed that no construction will be undertaken until the depletion charge is paid. SCS does not agree with the statement in the Service's biological assessment that "SCS has agreed to require funding (for the depletion charge) from project recipients." SCS has not altered the position taken in the January 1990 meeting, and

agreed to by a representative of the Service, that the charge would be paid before implementation, but the entity who pays would be determined before implementation begins.

7. SCS does not agree with the assessment of wildlife effects or the economic evaluation of wildlife-oriented recreation.

Detailed Comments

ALTERNATIVES

Alternatives are restricted to those actions which solve the stated need—salinity reduction in the Colorado River System. Several alternatives are identified. However, only two action alternatives were determined to be viable; other identified alternatives were not viable because they failed to meet identified criteria.

8. Page S-5.—The sentence on page S-5 will be changed to read "salinity reduction at a lower cost per unit than the majority of other units of the Colorado Salinity Control Program." The phrase on page I-7 refers to alternatives to be presented to individual landowners. We feel it explains the process adequately.

9. The sentence on page S-9 will be changed to read "plans which would result in reduction of salinity the Colorado River System at the least cost per unit would be given preference for implementation." The sentence on page IV-3 will be deleted since cost effectiveness is addressed in the previous paragraph.

10. Page I-2.—At the time planning was begun on the Price-San Rafael Rivers Unit, it was thought that rangeland could not be treated at a cost that would meet the least cost criteria of the salinity control program because of the large amount of land that would need to be treated. Work done on the Sand Wash Watershed under the Small Watershed Program has shown that the treatment cost is low enough to meet this criterion. However, planning on the Price-San Rafael Rivers Unit was already under way when this became known. A decision was made to assess the rangeland in this watershed separately. The report is in process.

11. Page IV-4.—Economic development by increasing the efficiency of agricultural production is not a "statutory requirement" and is not referred to in the DEIS in this way but as "selection criteria." Economic costs and benefits were raised as a concern during the scoping process. This concern was considered significant to decision-making. To clarify this criterion, the sentence has been changed to "Landowner acceptance by increasing the efficiency of agricultural production and income."

12. Page IV-7.—The Resource Protection Alternative was formulated to provide an acceptable level of protection of the resource identified in the need for action, i.e., the salinity level of the Colorado River System. This sentence will be changed to "was formulated to optimize salinity control."

13. There is a tradeoff between reduction of salinity in the Colorado River and other environmental concerns. Each increment of salt kept out of the river by "improving on-farm water management" results in wetland and/or upland vegetation changes, increased consumptive water use, and reduced irrigation return flows. Replacement of wetland habitat values is a goal of this project. There is no other target in the EIS to justify the statement that "very little wetland replacement has been targeted for losses of wetland acreage or values from the on-farm program."

14. NEPA implementation regulations (40 CFR 1500.2) state that "Federal agencies will to the fullest extent possible . . . identify and assess reasonable alternatives . . . that will avoid or minimize adverse effects . . . upon the quality of the human environment." SCS is using environmental considerations to the fullest extent possible when it selects action alternatives that maximize voluntary replacement because only voluntary replacement of wildlife values was specified in the Salinity Control Act. The purpose of environmental protection is met by actions and initiatives that would be taken to encourage voluntary wildlife habitat replacement. USDA has also agreed to backstop the voluntary replacement program.

15. SCS does not feel there is a need to analyze an alternative to modify the salinity control legislation to require mitigation since this alternative would not meet the need for action—to decrease salinity in the Colorado River System.

16. Page IV-32.—Over a 10-year period, Reclamation conducted investigations of the study area. These studies included a detailed investigation by CH2MHill. Under this investigation, inflow/outflow tests were made in 1982 on all classes of canals in the study area. During 1984, ponding tests were performed on class A canals. Based on the information collected from these studies, it was determined that canal improvements would not be cost effective. Several volumes of information regarding the CH2MHill study were published and are available for review.

17. Page IV-33.—Social acceptability is used in this section as one of the four "tests" referred to in *Principles and Guidelines* where it is defined as "acceptance by State and local entities and the public." Retirement of land from irrigation is not acceptable to county government or the Utah Division of Water Resources.

18. The cost estimate for retiring farmland is \$200 per ton, not per acre. This cost includes use of water for other beneficial uses (supplying water for additional power generation facilities, tar sands processing, or coal processing), not just the cost of buying the water. All identified uses would require construction of new facilities. This is not an average of purchase costs; it is the lowest cost of the alternative facilities divided by tons of salt saved.

19. The State policies that make retirement of land from irrigation not implementable are: State water law which states that water not beneficially used can be filed on by another user, and the policy that Utah will use all water allocated to the State by the Colorado River Compact. Water not used on land that has been retired from irrigation would flow by diversions. However, it would not remain in the streams for use by fish and wildlife. This water would

be used to fulfill junior water rights for users who did not participate in land retirement. There are more than 20,000 acres of land within these basins that have a water right but are not irrigated in an average water year. The result would be that the salt loading problem would be moved from one piece of land to another.

20. Water laws and policies can be modified by action of the Utah legislature. The State Engineer interprets and implements water laws.

21. Pages IV-42-46.—Environmental impacts are an important part of this project. While views of the salinity interests and the water users are discussed in the Social Effects Account, a broader view which includes environmental concerns has been addressed throughout the document. Reclamation and USDA have chosen to discuss impacts to the water users and salinity interests in the social analysis, and to treat the environmental interests in Chapter V, *Affected Environment and Environmental Consequences*, which reflects environmental and recreational concerns and lists steps towards mitigating those impacts or replacing values. Reclamation and USDA feel they have been responsive to all ideas by addressing those concerns.

WETLANDS

22. Cover page and page I-1.—The references to satisfying the regulatory requirements of section 404(r) of the Clean Water Act will be deleted.

23. Page III-6.—The only available documentation that using the same cost-share rate for wildlife habitat replacement as for irrigation will achieve an acceptable amount of wetland habitat value replacement is from the Uinta Basin Unit. In the Uinta Basin Unit, wildlife habitat values replaced are approximately equal to those being lost. Replacement is generally not acre for acre nor is it "in-kind." However, values are being replaced using the same cost-share rate. Experience in using a very high cost-share rate is that the agency, not the landowner, is perceived as the owner. The landowner does not take ownership and therefore does not feel responsible for maintenance.

To insure that habitat value replacement activities receive a high priority, SCS has recommended a priority rating system to the LSCC. The cost-share rate combined with a priority rating system that gives preference to plans that include wildlife habitat has been successful in replacing the wildlife habitat values as evaluated by the application record and the annual Monitoring and Evaluation Reports.

24. Page IV-15.—Stock water ponds constructed as part of the winter water program need to be constructed where they are accessible to livestock and fulfill requirements of good grazing management. If a pond is not contributing to salt loading, it would not be replaced. If a pond is contributing to salt loading and a site is available in a nonsaline area that meets the above criteria, that site would be used. This alternative would be implemented on a site-specific basis. Pond maintenance would be a part of a Resource Management Plan written for

the individual installation in cooperation with the SCS. Criteria for good grazing management would suggest that stock water ponds would both be located in wetland or riparian areas.

25. Page IV-20.—During a meeting held with Reclamation, SCS, EPA, and the Service, off-site mitigation was discussed and was acceptable to all parties. The statement that "Wetland wildlife habitat will be fully mitigated" refers only to Reclamation's off-farm measures. Reclamation's only commitment is to its own off-farm mitigation program. USDA would be responsible for its own program impacts as described in the DEIS.

26. Page IV-21.—Table IV-3 lists the overall impacts and proposed mitigation for Reclamation off-farm activities. This includes construction and nonconstruction impacts as stated on page V-9. The word "construction" will be deleted from the title.

27. Page IV-22.—The wording in this section will be changed to read "for the duration of the impact" as opposed to "for the life of the project."

28. Page IV-23.—USDA response to Executive Order 11990 (Protection of Wetlands) is included in an attachment, Environmental Commitments and Compliance. USDA policy for granting exceptions to Executive Order 11990 was published in the Federal Register 7 CFR 650.26.

29. There are, at present, no formal design criteria for wetland construction on salty soils. The statement that "replacement of wetlands with irrigation water on the same salty soil would cause the same water quality problem in the Colorado River" will be replaced with the following statement, "Lined ponds or wetlands can be created in the shale members of the Mancos shale. However, to prevent contribution to the salinity problem, these lined ponds would have no natural outflow. To prevent stagnation in ponds used for livestock there would need to be a piped outflow to a point where the water could be consumed without resulting in deep percolation or returned to a natural water body." This design would increase cost and management problems and could decrease wildlife habitat value since piped outflow removes potential for water-associated habitats below the pond or constructed wetlands. Maintenance (human disturbance) is high on constructed wetlands. Periodic maintenance might be needed to maintain integrity of the lining.

30. Wetlands and/or ponds can be created in the soils formed in the sandstone member units of the Mancos Shale (Emery Sandstone Member and Ferron Sandstone Member) without yielding salt. Each proposed site should be individually investigated with a backhoe pit or drill hole to 15 feet deeper than the proposed pond or wetland bottom to insure no sulphate salt problems will be encountered. This information will be added to the FEIS. The cost of the exploratory pit would be \$300 to \$500 per potential site.

31. Page IV-24.—The first sentence of this paragraph will be deleted since it is covered on the previous page as revised.

32. The statement regarding Utah water law has been deleted as a result of a new interpretation by the Division of Water Rights.

33. The test figures from the Uinta Basin Unit show a cumulative loss over the past 10 years of 1,500 acres of wetlands (mostly types 1, 2, and 9; a little 3 and 4) from irrigation improvements; construction of 140 acres of types 3, 4, and 5; and enhancement of wetland habitat on 1,000 acres.

In the Uinta Basin Unit, loss of wetland has had the largest effect on the yellow-headed blackbird, of the six species whose habitat is monitored. However, calculations indicate that the habitat values have been replaced. The 1,500 acres of lost wetlands had an average Suitability Index (SI) for the yellow-headed blackbird of 0.2 per acre across all types of lost wetlands; therefore, the value of the lost wetland is 300 (1,500 acres x 0.2) habitat units. The average SI of the 140 acres of new wetland is 0.8, resulting in a value of 112 habitat units gained. The average SI of the enhanced wetland was increased from 0.2 to 0.5 or 0.3. Using the 0.3 increase in the index value on 1,000 acres of improved habitat results in 300 habitat units; therefore, the change in habitat value computed for the yellow-headed blackbird is a loss of 300 habitat units and a gain of 112 plus 300 habitat units.

To address the concern about the models in the Uinta Basin Unit not targeting wetlands type 1, 2, and 9, SCS used a draft wet meadow model provided by the Region VII, EPA, Denver, to evaluate wetland impacts (final environmental impact statement, Uinta Basin Unit Expansion - Colorado River Salinity Control Program, Utah, December 1991, pages 56-61). The results of using that model showed generally a slight increase in the Habitat Suitability Index for wet meadow type wetlands (types 1, 2, and 9). These references will be added to Chapter IV, *Resource Protection Alternative, Fish and Wildlife Habitat Replacement*.

34. USDA does not feel that interagency discussions on the Grand Valley Unit are applicable to the Price-San Rafael Rivers Unit.

USDA agrees that the program should be implemented consistently in each of the salinity control units. However, each unit is operating under a separate Record of Decision. An attempt is under way to improve the implementation of the Price-San Rafael Rivers Unit over older units. The Uinta Basin Unit more closely represents the program to be implemented in the Price-San Rafael Basin. In the Uinta Basin Unit, the only planned practices that are not installed are those found to be physically infeasible. (See comment on page IV-59 below.)

35. The statement on the bottom of page IV-61 relating to enforcement was meant to cover the alternatives of bringing the contract into compliance or terminating it. This statement has been changed to be more specific: "If a landowner is found to be violating the contract, it may be terminated by the Agricultural Stabilization and Conservation Committee (COC). If it is terminated, the landowner will repay all or part of payments received as determined by the COC."

36. Page IV-27.—The 200-acre loss of wetland in the "No Action" alternative was incorrect. This estimate has been changed to 500 acres.

37. The calculations used to estimate wetland conversion were reviewed and a math error discovered. The error caused a significant overestimation of impacted acres. After correction, the Resource Protection (RP) Plan for onfarm activities has worst-case estimated impact of 5,621 acres converted of 36,050 acres treated. Table IV-11 will be corrected. The National Economic Development Plan (all sprinkler irrigation) has an estimated impact of 4,852 acres converted of 26,000 acres of treated land, or approximately 0.19 acre/acre treated. The per-acre impact for the RP Plan is approximately 0.19 acre/acre treated under sprinkler irrigation and 0.08 acre of wetland impact per acre treated by surface irrigation (10,050 acres). The average impact, based on the total acres impacted, is approximately 0.15 acre/acre treated. Sprinkler irrigation has a higher per-acre impact because it is assumed more ditches are eliminated and sprinklers are managed more efficiently.

38. Page IV-59. Reclamation is confident that the development of a mitigation area will be accomplished through coordination with the Army Corps of Engineers. Reclamation would work with the Corps in developing mitigation for this project. This could mean that the area to be developed for mitigation would be selected based on the 404 guideline criterion. Also, guidelines set through the 404 process would be followed throughout the development.

39. The 60-percent estimate of salinity contracts that contain some wetland wildlife practices is based on data from the last 3 years in the Uinta Basin Unit since the priority rating system has been revised. Of this 60 percent, at least half, or 30 percent, contains wetland practices, while the balance contains plans for upland habitat. Ninety-nine percent of the practices planned were installed. The only reason a practice is not installed is because it is found to be physically infeasible. Landowners in the Uinta Basin Unit now sign a statement saying that they understand that if wildlife practices are not installed, their priority will be adjusted.

40. In the Uinta Basin Unit, 1,500 acres of wetland have been converted to upland/cropland; 140 acres of upland/cropland have been converted to wetland, and 1,000 acres of wetland have been enhanced.

41. No acres of wetland have been lost in the Hancock Cove project because it has not been implemented. The estimates of habitat replacement were used because they provided a method of estimating costs.

42. Referenced statement is, "If annual reviews revealed objectives for habitat replacement were not being met recommendations would be formulated to adjust the program." USDA's objective for habitat replacement is replacement of all habitat values. The reference to 49 acres used to estimate costs of habitat replacement has been removed since it was interpreted as an objective rather than a tool. SCS has said their goal is replacement of overall habitat values (not necessarily wetland for wetland values). Values can be increased on existing acres, not just by creating new habitat.

43. Page V-2.—USDA thinks that with inclusion of a discussion of initiatives for wetland habitat value replacement and the backstopping commitment to seek funds, the statement that "wetlands replaced to the maximum practical extent" should stand.

44. As discussed on this page, fish habitat is important to threatened and endangered species. A statement will be added to indicate that the depletion charge will be paid before implementation. Objectives for replacement of fish habitat are contained in Chapter IV, *Fish and Wildlife Habitat Replacement*.

45. Page V-3.—Title 16 sections 661-666(c) of the U.S. Code of Federal Regulations, the Fish and Wildlife Coordination Act (FWCA), authorizes the Service and the State agency responsible for fish and wildlife to be consulted "with a view to the conservation of wildlife resources by preventing loss of or damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development."

Sections 662(b).—Provides that the reports and recommendations from the fish and wildlife agencies will be "made an integral part of any report prepared or submitted by any agency of the federal government responsible for engineering surveys and construction of such projects. . . ." and that "The reporting officers in project reports of the Federal agencies shall give full consideration to the report and recommendations of the Secretary of the Interior and to any report of the State agency on the wildlife aspects of such projects and the project plan shall include such justifiable means and measures for wildlife purposes as the reporting agency finds should be adopted to obtain maximum overall project benefits."

The SCS "fully considered" the recommendations as listed in the FWCA report and found they cannot be implemented by SCS within the authority and constraints of the onfarm program. The entire Coordination Act Report has been "made an integral part of the report" by being included as an attachment to the Plan/EIS; therefore, SCS has fully complied with the FWCA and has fully disclosed the views of the wildlife agencies as required by the FWCA and NEPA.

46A. Pages V-17 and 18.—The *Wildlife OnFarm Impacts* section recognizes that a significant number of wetland acres would be impacted. However, there is an important difference between acres and values. To clarify this difference, the third sentence of this paragraph has been changed to read, "when put in terms of value to several species of wildlife, the acreage may appear to indicate a more significant change than the actual change in habitat values."

The Uinta Basin Unit monitoring is not discredited by a statement about weather patterns. The statement is made to provide the reader with the information that the Uinta Basin has undergone 5 years of continuous drought. Extended drought has significant impacts on all habitats, but especially those dependent on irrigation water. This impact is not a result of the project, but drought impacts and project impacts cannot be separated. The monitoring program was designed to indicate a trend in habitat values, not absolute values.

A study that is scientifically conclusive is not possible when dealing with numerous environmental variables and management options of the private landowner.

46B. SCS agrees that many resident and migratory bird species used the area but does not agree that these species would be significantly affected. It should be noted that over 4,100 acres of the 5,620 acres of impacted wetlands occur on irrigated fields used for agriculture that would continue to be used for agriculture after the project was implemented. The whole project area would change little in overall habitat characteristics. Irrigated agriculture would remain irrigated agriculture. Significant site-specific changes can occur; however, agriculture is a dynamic activity with or without the program. To the casual observer, the area would remain an agricultural setting with its associated wildlife populations.

The impacted acreage and the estimated depletion to the streams of 22,460 acre-feet are for an average year. In a drought year, as has occurred for the previous 4-5 years, the return flows will be similar to return flows with the project in a drought year. The project would have very little impact on depletion or irrigation water supply to artificial wetlands or open water areas such as Desert Lake in a drought year. In above-average water years, the impact on the wetlands would not be as severe as in an average year since areas below the farms would receive increased runoff.

46C. SCS reviewed *Fauna of Southeastern Utah and Life Requisites Regarding Their Ecosystems* (Utah Department of Wildlife Resources publication number 90-11). In EPA's letter, 40 species were listed. EPA states that the species listed either solely or for a major life requisite rely on emergent wetlands. This is true, but most of these species also use agricultural land. Information in the publication shows that agricultural habitats are critical for nine of these species, high for five, substantial for nine, and limited for one. The rest of the 40 species generally require wetland containing open water (lakes or ponds) for significant periods, or exposed shorelines. As stated in the DEIS, large open water areas would not be significantly impacted. The majority of wetlands impacted are generally sedge/rush/saltgrass, in farm fields, with no significant open water adjacent to the site. The species for which use of agricultural habitat is limited is the northern leopard frog which requires perennial open water in March. Since irrigation water is not available in March, this species would not be affected.

Most of the species requiring wetlands occur at all elevations in southeastern Utah. The project area generally occurs between 5300 feet and 5800 feet, with the exception of the small area around Moore at approximately 6200 feet. Habitat at other elevations would not be affected.

It is not feasible to address specific impacts to each species that occurs in the project area. SCS recognizes that if a habitat is changed for a species totally dependent on a very specific habitat, it will be affected. Some species would benefit and others would be negatively impacted due to the change in water management on irrigated fields; however, no single habitat would be completely lost. All types of habitat that occurred prior to the project would remain after the project. The acreage of some would increase, while other types would

decrease. Worst-case estimates of habitat changes resulting from the proposed project are discussed in the EIS in chapter V and displayed in table V-4. Replacement of wetland is discussed in Chapter IV, *Fish and Wildlife Habitat Replacement*.

46D. The long-billed curlew was not mentioned because most of the work on the DEIS was done before it was declared a Federal Category 2 candidate species. Information on impacts to the long-billed curlew will be added to the FEIS, Chapter V, *Threatened and Endangered Species*.

46E. SCS disagrees that populations of northern harrier and white face ibis would be "decimated" as stated in the CAR. Agriculture is critical for both species (DWR report 90-11).

Information on these two species, as well as the loggerhead shrike, identified in the CAR as a species of management concern, will be added to Chapter V, *Wildlife Impacts*.

The entire project area proposed for treatment comprises 2 percent of the total area in Carbon and Emery Counties. The DWR's publication No. 90-11 covers all of southeastern Utah.

MONITORING AND EVALUATION

47. Page IV-56.—The *Monitoring and Evaluation (M&E)* section has been revised to indicate that inflow and outflow data on the Price and San Rafael Rivers and principal tributaries would be assembled from the available GS gauging stations. The GS and Utah Department of Environmental Quality are currently collecting water quality data upstream and downstream of the proposed project area. Site-specific monitoring and evaluation of representative irrigation systems would be completed in order to verify projected changes in irrigation efficiency and/or reductions in deep percolation from irrigation.

48. The USDA SCS *Framework Plan for Monitoring and Evaluating the Colorado River Salinity Control Program* will be the basis for developing the project-specific M&E plan. A copy of the Framework Plan will be added to the FEIS as an attachment. The following paragraph is being added to the M&E section: "The monitoring and evaluation components for wetland/wildlife would include: tracking wetland types and amounts, field collection of habitat variables and analysis using HEP, establishment of selected off-farm vegetative transects, and analysis of individual salinity control plan information." Wetland monitoring would include the establishment of 18 photo sites to track the extent of areal change on a 3- to 5-year cycle. Photo transects were selected and low altitude true color aerial photography taken in 1992.

49. A statement will be included in this section that . . . "the Price San Rafael Unit M&E plan will be developed by SCS in consultation with other agencies prior to the development of individual on-farm salinity control contracts."

OTHER COMMENTS

50. Pages S-2 and II-2.—EIS will be revised to include "and a plan of implementation to meet those standards."

51. Page S-3.—All of the 66,450 acres are irrigated at some time over a period of years. Based on past trends, it is estimated that the probability of the full acreage being irrigated is about 20 percent.

In any given year, there is a 50-percent chance that there will be enough water to irrigate about two-thirds of the 66,450 acres with water rights, or 45,280 acres. This 45,280 acres was considered the average number of irrigated acres and was used for planning. The participation rate for improved irrigation systems was applied to this number. The design and cost estimates were based on the result. SCS personnel felt that, considering the average available water supply, 45,280 acres was the best estimate of the acres on which an improved system could be feasibly installed because the water supply for acres over 45,280 is not reliable enough to justify the expenditure of funds. The EIS will be revised to change references from "presently irrigated" to "irrigated in an average year."

52. No new land would be irrigated. All land that would be irrigated is irrigated in some years. The more acres that are irrigated with the amount of water available in any given year, the less deep percolation there will be and the less salt loading there will be. These effects were taken into account in the hydrosalinity analysis.

53. Page S-5.—This paragraph will be revised to read, "Formulation of alternatives took into account the fact that in an average year there is not enough water to adequately irrigate all the land that has a water right. When an average water supply is available, only about 70 percent of the land with water rights will be irrigated. Some of this 70 percent presently receives only part of what is considered a full water supply. The combination of sprinkler and improved surface irrigation will provide a full water supply to more acres by improving the efficiency of water use."

54. Distribution of water is done by the irrigation company. USDA has no control of who gets late-season water. However, the fact that sprinkler systems would be installed by lateral means that it is likely that in many cases an entire area would have improved efficiency.

There is late-season irrigation now. When there is more acreage of late-season irrigation with the same amount of water, there would be less deep percolation and less salt loading because more late-season irrigation cannot occur without improved efficiency. These factors were considered in computing the average salinity reduction. There is no saved water. Water is stretched by increasing efficiency to provide full irrigation instead of partial irrigation. The 30 percent of land with water rights not included in this project has water. However, it has water less than 50 percent of the time, and the water supply each year is different. USDA cannot determine and has no control over whether water saved would be used to supply the full amount of water on land with an

improved irrigation system or supplemental water on lands without improved systems. However, an individual would receive a greater benefit by using the water with the greater efficiency provided by an improved system.

55. The plan does not propose increased irrigation in the sense that there would be more water or more acres irrigated. The proposed project would increase irrigation efficiency so that fields now partially irrigated could be fully irrigated. The environmental impacts of increased irrigation efficiency are documented in the EIS.

56. The statement at the bottom of page I-6 is in error and will be deleted. Salinity benefits are not reduced by reuse of irrigation water. In the Hydrosalinity Analysis attachment, tailwater crop consumptive use (line 14) is greater with the proposed project than without. This results in less deep percolation from crop irrigation. Consequently, with the proposed project there is less ground water available and less Return Flow Crop Consumptive Use (line 39). However, this use does reduce the ground-water outflow which is the carrier of salt to the Colorado River System.

57. The entire section on water rights has been rewritten. Therefore, page III-2 no longer contains the referenced statement. See above for explanation of the fact that water saved will not result in increased salt loading.

58. Page S-7.—The Upper and Lower Colorado River Basin funds are funds created to repay, among other things, Salinity Control Program improvements. These funds are collected as a surcharge on Colorado River Basin hydropower revenues.

59. Page S-9 and IV-3.—References to Public Law 92-500 will be replaced with references to Public Law 93-320 on page S-9. The paragraph referencing Public Law 92-500 on page IV-3 has been deleted.

60. Page I-2.—The text has been changed to state that the objective of the Salinity Control Program is to "meet the water quality standards for salinity adopted by all basin states." On page II-2, a reference has been added to Public Law 93-320 and to the water quality standards.

61. Page I-9.—The wording in this section will be changed from "established under the FWPCA" to "created by the states in response to Public Law 92-500."

62. Page II-3.—Title of table II-2 will be changed as suggested. Under the 1990 Plan of Implementation referred to in EPA's letter, the frequency of compliance would be 100 percent, although salinity levels may vary several hundred milligrams per liter above or below the numeric criteria. These variations in salinity are due to climatic conditions and runoff.

63. Page II-9.—The salinity evaluation determined that the salt loading from each of the subunits in the San Rafael drainage is similar and salt loading from the subunits in the Price drainage is similar. The salinity yield potential (salt

loading factor) in the Price Basin, is however, greater than the salinity potential in the San Rafael Basin as shown in the hydrosalinity analysis attachment.

In prioritizing areas for participation, a single value would be used for all land in the Price Basin, and a single value would be used for all land in the San Rafael Basin. A discussion of the relative contributions of salinity by area will be added to page II-9.

64. Page III-1.—The phrase "present and anticipated opportunities and" has been deleted. The present and anticipated opportunities are discussed in chapter IV.

65. Page III-2.—The entire *Water Rights* section has been rewritten. The second paragraph of the new section addresses instream flows as a beneficial use "only when such rights are held in the name of the Utah Division of Wildlife Resources."

66. Page III-6.—Impact minimization is discussed in Chapter IV, *Resource Protection Plan—Fish & Wildlife Habitat Replacement and Cultural Resources*.

67. Page IV-24.—The Service, represented by Bob Jacobsen, Regional Director, agreed that planning on the Price-San Rafael Rivers Unit could proceed without identification of the entity that would pay the depletion charge, as long as it was understood that this charge would be paid before any implementation is begun. This agreement was reached in a meeting held on January 18, 1990, with the SCS, Reclamation, and the members of the Salinity Control Forum Technical Committee. The statement in the attachment is in error.

68. Table IV-8 has been changed to "Depletion of water may endanger fishes. Offset by depletion payment." In table V-1, the following statement will be added, "no implementation will be carried out before the depletion charge is paid." (This statement will be inserted in the Environmental Commitments attachment.) It does not indicate that compliance has been accomplished.

69. Page IV-27.—All water owned by UP&L is considered used for power generation in the No Action Alternative. When this water is removed from irrigation, it will result in a 2,000-acre-foot depletion of return flow to the river from deep percolation in an average water year, not a 7,140-acre-foot depletion. This will be corrected. Figures in the table IV-11 will be revised to correct errors.

70. The salt load reduction resulting from the conversion of this water to power production will be 9,500 tons, not 14,080 tons. This will be corrected. The tons of salt removed as a result of the No Action Alternative will be added to table IV-11.

71. It is assumed that when UP&L uses the water, none is returned to the river; 13,400 acre-feet is removed from irrigation and devoted to power production.

72. Specific information about ongoing conservation and expected conversion of cropland to other uses will be added in the *No Action Alternative, Onfarm* section. The lands to be removed from a fully irrigated status are those now irrigated with water leased from UP&L. It is possible that a small amount of land could be converted from cropland to residential, but considering the fact that both counties lost population between 1980 and 1990, no appreciable impact can be foreseen.

73. The salinity savings presented in table IV-11 were inconsistent with other figures in the DEIS. This table has been revised. Further explanation of terminology has been added to the Hydrosalinity Analysis attachment.

74. We have been unable to identify the derivation of the 32,110 acre-feet used as an example by EPA. Using figures taken from the Hydrosalinity Analysis attachment, the reduction of 18,531 acre-feet in the Price River basin results in a salinity reduction of 92,945 tons, or 5.01 tons per acre-foot. In the San Rafael River Basin, reduction of 18,654 acre-feet results in a salinity reduction of 68,096 tons of salt, 3.65 tons per acre-foot. The corrected figures for the "No Action" alternative are a depletion of 2,000 acre-feet resulting in a reduction of 9,500 tons of salt or 4.7 tons per acre-foot.

75. Table IV-11 has been corrected to agree with page V-22.

76. Page IV-39.—Impact to threatened and endangered species is covered in the Biological Assessment attachment. Table IV-8 will be revised to state, "Depletion of water in stream may affect endangered species. Offset by depletion payment."

77. Page V-3.—The project objective is to reduce the salinity in the Colorado River System. The chemical integrity of the Nation's waters is improved because less salt would be carried in the water of the Green River and the Colorado River. The biological integrity of the water in the Green River and the Colorado River is being protected for species that need less salty water. The physical integrity of the stream system would be preserved. Streams would be essentially unchanged, although there would be somewhat less water in each stream at certain times of the year.

78. Page V-21.—Water quality data exist, and all parameters were reviewed in the creation of this project. The exclusive use of salinity findings in the EIS reflects the main purpose of the salinity project. The question of a domestic water supply being utilized as a stock water source has also been investigated. Information collected regarding domestic water use indicates that a "cleaner" source of stock water produces livestock that are less susceptible to illness.

79. Page V-24.—The change is not significant because, as stated, most of the depletion takes place during high-flow months. The change in water as a result of increased efficiency is never as great as the change imposed by the natural high and low flows of the river. The impact on each stream is assessed individually, and the cumulative effect on the two rivers is assessed in attachment VIII. Assessment is done by month in acre-feet and percentage

change. This attachment is referenced in the following paragraph. SCS does not feel that clarity would be improved by including the data in the body of the document.

80. Page V-25.—A statement that, "No fish, other than the roundtail chub, were identified as important by DWR below the irrigation diversions in the project area" will be added to *Other Fishery Resources*. Other aquatic life and stream integrity would not be significantly impacted because natural variability of the stream is greater than the project impact.

Depletion to streams described in the DEIS is based on average annual water supply. Past records indicate that year-to-year natural variability in streamflow is greater than the changes resulting from the project. Drought years result in flows in area streams similar to the estimated flows for the project. These comparisons between results of natural variability and project impacts are detailed on page 4 of attachment VIII.

The cumulative impact of depletion of water in Ferron Creek is unknown (as stated on page V-44) because detailed information on the life requisites of the roundtail chub is not available (see page 3 of attachment VIII). However, Ferron Creek already has a recorded flow that varied from zero for 49 days to 900 cfs for 18 days. Implementation of the project would not create this degree of variability. Since this is the only identified adverse impact and this impact is less than the impact of natural conditions, it has been determined to not be significant.

As stated previously, SCS has given full consideration to the Fish and Wildlife Coordination Report and recommendations for the roundtail chub and found that recommendations cannot be implemented by SCS within the authority and constraints of this program.

81. Page V-36.—SCS did not assign an economic value to the wildlife-oriented recreation because there would not be a significant impact. As stated in the DEIS (page V-36), the acreage of irrigated agriculture associated habitat would not change.

UDWR in the Vernal area of the Uinta Basin Unit reported no change to a slight increase in the big game herd after 11 years of implementation of the salinity control program.

Analysis of the upland game population and hunter success trends in the Uinta Basin Unit shows no significant difference than in the Statewide trends, which are downward, as are national trends.

In a recent environmental assessment on replacement of all open ditches with pipeline to serve the Ouray National Wildlife Refuge which lies within the adjoining Uinta Basin Unit, the Service indicated no significant concern with recreation although all farms along the route would be converted to sprinkler irrigation.

The Uinta Basin Monitoring and Evaluation Report indicates no significant impact on pheasant habitat. This may be a result of incorporation of conservation measures that improve the value of remaining and/or replacement habitat.

The dollar value used by the Service in the Fish and Wildlife Coordination Report for Nonconsumptive Wildlife Oriented Recreation was quoted from a National Survey publication that does not have county data. The Service said that the total for the county was computed by taking a percentage of the State total, possibly based on the ratio of county population to State population. This would then represent all nonconsumptive wildlife-oriented recreation in the two counties. However, the irrigated areas which could be affected by the preferred alternative comprise only 45,280 acres of the 2.8 million acres in the two counties, or about 2 percent. About two-thirds of the 2.8 million acres are public land. In a county with this much public land, it is assumed that wildlife-associated recreation takes place primarily on public land where access is unrestricted, although no counts of wildlife recreation on private versus public land are available. Private land has restricted access for wildlife-associated recreation. Most who use these lands for recreation in addition to the immediate family are extended family or close friends of the landowner. As stated in chapter V, there may be some short-term effects to the recreationists who do use the land during construction of irrigation systems but there will be no long-term, significant impact.

The livestock pipeline keeps the cattle out of Ferron Creek (cattle prefer water from the pipeline because the water is less salty) and keeps the water out of canals in the winter, thereby decreasing deep percolation and the resulting salt load.

Before construction of the Mill Site Reservoir, average flow in Ferron Creek was lower in June, July, August, and September. The average flow during June, August, and September was lower than the estimated flow with the project.

RESPONSE TO U.S. FISH AND WILDLIFE SERVICE LETTER

The Soil Conservation Service (SCS) has reviewed the Fish and Wildlife Coordination Act Report (CAR) and given consideration to its recommendations. The report is included in the PR/DEIS to fully disclose these recommendations. SCS is complying with recommendations within its authority and funding capabilities.

The Colorado River Basin Salinity Control Act Amendment (Public Law 98-569) states that "replacement of fish and wildlife values foregone" is voluntary. The U.S. Department of Agriculture (USDA) is following this law in the plan for implementation by offering technical and financial assistance to landowners to install and/or enhance wildlife habitat on a voluntary basis.

USDA is encouraging replacement of wildlife values by providing information to landowners on changes in wildlife habitat that will result if the project is implemented and alternatives for replacement of habitat values lost. The replacement of these values by the landowner may include creating habitat

and/or enhancing existing habitat. Cost sharing for wildlife habitat is provided to the landowner at the 70-percent rate. USDA will also encourage the Local Salinity Coordinating Committee (LSCC) to give a priority rating to plans including wildlife habitat. If this strategy does not produce the desired results, the LSCC will be encouraged to take further actions such as petitioning the Secretary of Agriculture to raise the cost-share rate and to target specific funds to wildlife habitat.

The following statement will be included in the Price-San Rafael Rivers Unit Final Environmental Impact Statement: "USDA believes that voluntary habitat replacement within the Colorado River Basin Salinity Control Program will be successful in replacing wildlife values foregone within the Price-San Rafael Salinity Unit. However, if monitoring indicates trends of lost wildlife values, USDA will seek additional funding authority to assure replacement of these values."

USDA has no funding or authority to buy the 12,384 acres of land for mitigation as suggested in the CAR.

The CAR appears to assume two impacts on the river flows that are not in keeping with the PR/DEIS. First, the CAR states that "the future without project condition may represent more water than will actually be available in the stream . . . future power development will ultimately result in less water in the streams" (CAR - page 16). As stated in the PR/DEIS (page IV-27), the No Action Alternative (future without project) assumes that UP&L uses all the water it owns. Therefore, future power development will not result in less water in the streams than the future without project condition. Impacts on streamflow resulting from the project are based on the difference between the "No Action" or "Future Without Project" condition and the "Future With Project" condition.

Second, the CAR seems to assume that the difference between the "Future Without Project" and the "Future With Project" is the same increment every year. The differences given in Attachment VIII are based on average annual water supply. Past records indicate that changes from year to year are greater than changes resulting from the project. For example, in 1977, Ferron Creek had no flow for 49 days during June, July, and August; but in 1980, flow exceeded 900 cubic feet per second (cfs) during 18 days in June. The estimate made by SCS for the change in average annual flow for Ferron Creek resulting from the project ranges from 90 acre-feet in January, February, and March to 1,480 acre-feet in June. These numbers equate to 1.5 cfs in the winter months to about 25 cfs in June at the height of the irrigation season.

The amount of depletion resulting from the project will vary with actual water supply. During the recent drought, it is estimated that the efficiency of irrigation water use was 60 percent. The estimated efficiency resulting from the project is 60 to 65 percent. Therefore, if the project is implemented, there will be no significant difference in irrigation return flow in years of low water. For these reasons, we feel that effects of reduction on streamflows during spring and early summer months on riparian vegetation or maintenance of streambed habitats resulting from the project cannot be quantified.

As stated in Attachment VIII of the PR/DEIS, a literature review uncovered no specific information on the roundtail chub. Information that was found showed roundtail chub surviving in a stream with flows lower than the estimated flow after project implementation for all but Ferron Creek. The flows in Ferron Creek are completely dependent on irrigation return flow and releases from Millsite Reservoir and are highly variable. As stated above, impact of the project is less than variability resulting from changing annual water supply and previously existing irrigation use. Therefore, it is concluded that the selected plan will have no measurable adverse impact on the existing roundtail chub populations.

We understand that depletion fees cannot be used to study the roundtail chub. Page VI-8 will be corrected to replace this response with the following: "Since USDA recognizes no measurable adverse impact to the roundtail chub, USDA does not feel that mitigation is required."

USDA agrees that the depletion fee will be paid before project implementation as stated in the PR/DEIS. However, in keeping with a verbal agreement made between SCS and U.S. Fish and Wildlife Service, planning will continue up to the point that feasibility is determined before the payee is determined.

OTHER ISSUES ADDRESSED

Issue 1: State water law does not recognize water for waterfowl as a beneficial use if used by private individuals.

Environmental Protection Agency, Letter
Cottonwood Creek Consolidated Irrigation Company, Letter
Gene Johansen, Emery County Hearing
Utah Division of Water Rights, Letter

Response: According to the State Engineer, the option of an individual landowner using water for wildlife could be considered a beneficial use. In a letter from the State Engineer: "We would accept applications by individuals for the purpose of irrigating marsh lands on their property for wildlife and waterfowl habitat." It is therefore our understanding that this option would be available and is acceptable to the State Engineer.

Issue 2: Can water made available from salinity control be protected by the State for in-stream flows?

Environmental Protection Agency, Letter
Cottonwood Creek Consolidated Irrigation Company, Letter
Gene Johansen, Emery County Hearing
Utah Division of Water Rights, Letter

Response: As modeled, the preferred salinity control plan actually shows that there will be a decrease or a depletion of flows.

Issue 3: How will the water rights to cover wildlife development for mitigation be acquired.

Environmental Protection Agency, Letter
Cottonwood Creek Consolidated Irrigation Company, Letter
Gene Johansen, Emery County Hearing
Utah Division of Water Rights, Letter

Response: Water rights may be purchased from willing sellers and change applications filed to accommodate wildlife mitigation. The State Engineer and other appropriate sources will be consulted as this process occurs.

Issue 4: The Salinity program will create administrative problems through the delivery of two classifications of water and no storage rights for primary water in the Reclamation reservoirs.

Emery County Water Conservancy District, Letter
Jay Humphrey, Emery County Hearing
Cottonwood Creek Consolidated Irrigation Company, Letter
Gene Johansen, Emery County Hearing
Utah Division of Water Resources, Letter

Response: The salinity program will have no impact on the historic classification of water. Water administration will occur as it has in the past. Upon authorization, laterals will be sized to be sufficient to hold all required flows.

Issue 5: Water rights owners have a right to apply water onto their land, and a right to allow runoff to leave their land. Water rights owners have no obligation to do anything to change the salt content of the runoff. No federal agency or policy agency can take that right away from an individual.

Montell Seely, Letter

Response: We concur with the fact that individuals are the owners of their own water rights. As such, they are entitled to use their water right as they wish within the bounds of state water law. The proposed salinity project is voluntary and will not require any holder of water rights to lose control of those rights. There is no attempt to take away rights from the owner.

Issue 6: We do have a concern about the winter water portion of the project, the lining of ponds and how it may affect water rights. It is suggested that Reclamation and Soil Conservation Service look at ways of allowing the companies to lease or transfer their water to the various delivery systems to cover their withdrawals during the winter months.

Utah Division of Water Rights, Letter
Huntington-Cleveland Irrigation Company, Letter
Carbon Canal Company, Letter
Utah Division of Water Rights, Letter

Response: **Water rights are subject to forfeiture or lapse if unused for five consecutive years. However, we believe that there will be opportunities for those holding winter water rights to divert this water into existing water delivery systems in return for the opportunity to take water out of that system. This would protect those water rights from being lapsed.**

Issue 7: From reviewing the document, it appears that the increased depletion under this project will result from the improvements proposed to the irrigation conveyance systems and converting from flood irrigation to sprinkler irrigation. On many river systems in Utah, the water users on the lower reaches have historically relied upon irrigation return flows to supply all or more efficient irrigation methods.

Utah Division of Water Rights, Letter
Cottonwood Creek Consolidated Irrigation Company, Letter
Gale Jorgensen, Emery County Hearing
Clyde Magnusen, Letter
Clyde Magnusen, Emery County Hearing
Jay Humphrey, Emery County Hearing
Courtney Guyman, Emery County Hearing
Gale Jorgensen, Letter

Response: **It is recognized that the issue of downstream water rights must be addressed. By law, any actions that could affect vested water rights must first be approved by the State Engineer. We will be working closely with the State Engineer as this project proceeds.**

Issue 8: Can a water user increase the historical consumptive use under his water right as a result of implementing more efficient irrigation methods?

Utah Division of Water Rights, Letter
Gene Johansen, Emery County Hearing
Southern Utah Wilderness Alliance, Letter
Cottonwood Creek Consolidated Irrigation Company, Letter
Clyde Magnusen, Letter
Jody Williams, Utah Power and Light Company, Letter
Utah Division of Water Rights, Letter
Cottonwood Creek Consolidated Irrigation Company, Letter

Response: **The issue of increasing historical consumptive use becomes very complex. Guidance on this issue must ultimately be provided by the State Division of Water Rights (State Engineer) and will probably have legal precedence as its basis.**

Issue 9: We are concerned with the reduction of water available to Desert Lake and Olson Reservoir. We recommend long-term monitoring of these flows be conducted and initiated before project construction. If impacts occur to Desert Lake, mitigation will be expected.

Utah Division of Wildlife Resources, Letter
Ken Phippen, Carbon County Hearing

Response: **As stated in the EIS, flows to be delivered to Desert Lake will be sufficient for wildlife habitat. During fiscal years 1991 through 1993, Reclamation has provided drought relief funding for improvements at the WMA. Gaging stations have also been installed to monitor flows along two washes. We feel that this effort would provide the long-term monitoring to Desert Lake. In order to avoid impact to the Olson Reservoir area, we propose that the immediate surrounding irrigated area not be included in the salinity program. This would avoid affecting the wetland habitat area.**

Issue 10: There is a water rights conflict with the depletion of water to the Colorado River. It could be argued that this project is appropriating the additional depletion of about 25,000 acre-feet without filing an application. On the other hand, it can be argued that the water user is within the limits of his water right and is not exceeding his water right acreage or diversion allowance.

Utah Division of Water Rights, Letter

Response: **This issue of increasing historical consumptive use becomes very complex. Guidance on this issue must ultimately be provided by the State Division of Water Rights (State Engineer) and will probably have legal precedence as its basis.**

Issue 11: Assumed pipeline sizes listed in the plan (page IV-11) are undersized for a demand delivery system. The planning concepts and associated cost estimates in the proposal should be more realistic with the recommendation of the planners.

Cottonwood Creek Consolidated Irrigation Company, Letter
Jay Humphrey, Emery County Hearing
Sherrill Ward, Emery County Hearing
Montell Seely, Letter

Response: **The preliminary irrigation designs in the EIS are based on the water rights of the landowners and the consumptive use of their crops. The systems were designed with the understanding that all demands would be met. The pipeline sizes are estimates and will be sized in more detail upon project authorization. The estimated efficiency of the improved systems and the consumptive crop use were used in the calculations to determine the water needs. Based on existing conditions, the current water rights will be met.**

Issue 12: Page IV-20, indicates the 330 acres of artificial, irrigation induced wetlands will be lost due to the project and will require mitigation. Since water is being left in the canal during the growing season, the wetlands will still receive the necessary seepage to be sustained. We recommend a mitigation program based on actual loss to be determined by inventory taken as the project proceeds.

Cottonwood Creek Consolidated Irrigation Company, Letter
Clyde Magnusen, Letter

Response: **The 330 acres of irrigation-induced wetlands are based on the 156 miles of open, unlined waterways. These waterways are primarily**

laterals, but the Clipper Canal, a 6.8-mile canal in the Cottonwood Creek area, could be eliminated as well. Other canals that would be dewatered in the winter would have no effect on the loss of artificial wetlands and are not included in the 330-acre estimate.

Issue 13: Why doesn't the EIS address the question of lining canals?

Jody Williams, Utah Power and Light Company, Letter
Gale Jorgensen, Emery County Hearing
Clyde Magnusen, Letter
Clyde Magnusen, Emery County Hearing
Jay Humphrey, Emery County Hearing

Response: Extensive canal seepage tests have been conducted in the area. The results have indicated that canal lining would not be cost effective under the Salinity Control Program. Information regarding these seepage studies is available at Reclamation's Provo Projects Office.

Issue 14: If water is taken out of the canals during the winter, livestock would be able to cross the canals that were previously used as a fence.

Lyle Bryner, Carbon County Hearing
Boyd Marsing, Carbon County Hearing

Response: Fencing will be provided at each location where the canals are being used as barriers for livestock.

Issue 15: There has been 32,500 acre-feet of water taken off the Cottonwood Creek system. The effects of the removal of water from the system on salinity control should be discussed in the document.

Gene Johansen, Emery County Hearing
Clyde Magnusen, Letter
Courtney Guyman, Emery County Hearing
Clyde Magnusen, Emery County Hearing
Jay Humphry, Emery County Hearing

Response: Text has been added in Chapter I to discuss the industrial use of water from Cottonwood Creek.

Issue 16: We recommend that the distribution list be expanded to include all entities that are directly involved with the proposed project.

Cottonwood Creek Consolidated Irrigation Company, Letter
Ross Huntington, Emery County Hearing

Response: Due to miscommunication, the draft Environmental Impact Statement did not include many individuals and organizations who

should have received an initial copy of the document. The distribution list has been updated and all individuals who have participated in the public meetings since the draft will receive a copy of the final document.

Issue 17: On page S-4, the Scofield Reservoir is managed for rainbow and cutthroat trout, not brook trout.

On page IV-20, the Golden eagle nests require buffer zones of 1/2 mile, not 1/4 mile as stated.

On page IV-24, A change should be made from Utah Division of Natural Resources to Utah Department of Natural Resources.

On page V-6, It should be noted that a pronghorn herd currently exists in the Castle Valley area, and is part of the Iclander Wash herd.

Utah Division of Wildlife Resources, Letter

Response: These changes have been incorporated into the document.

Issue 18: The capacity of Cleveland Reservoir is 5,340 acre-feet and the capacity of Hunting for Reservoir is 5,616 acre-feet. Instead of the values listed in table 5-6.

Utah Division of Water Rights, Letter

Response: These changes have been made in the document.

Issue 19: It is suggested that the footnote on page I-2 be reworded to indicate the 1922 Colorado River Compact apportioned the waters between the upper and lower basins and the 1948 Upper Colorado River Compact apportioned the waters between the states of Wyoming, Colorado, Utah and New Mexico. It is also suggested that the word "guaranteed" not be used.

Utah Division of Water Rights, Letter

Response: This change has been made in the document

Issue 20: In Table IV-I, The EIS fails to provide a data source for footnotes 2 and 3.

Southern Utah Wilderness Alliance, Letter

Response: A footnote has been added to table IV-1

Issue 21: From our hydrographic survey maps the acreage for the Ferron Creek drainage has been determined to be 14,498 acres. The Moore area served by the Independents Canal from Muddy Creek acreage is 2,029.80 acres. III-2 paragraph 3.

Utah Division of Water Rights, Letter

Response: The Water Rights portion has been re-written to reflect these and other comments.

Issue 22: The project should be set up so that farmers maintain control of their water. We have a lot of flexibility on our system. We do not want to lose this flexibility.

Tracy Behling, Emery County Hearing
Ferron Canal & Reservoir Company, Letter
Emery County Water Conservancy District, Letter

Response: The project will not interfere with an individual's water rights. Individuals are entitled to use their water right as they wish within the bounds of state water law. The proposed salinity project is voluntary and will not require any holder of water rights to lose control of those rights. There is no attempt to take away or control the rights of any owner.

Issue 23: We question the wording of the last paragraph. Rather than the objective of the salinity program "to improve downstream water quality", it is to meet the water quality standards for salinity adopted by all the basin states. Clarification of the salinity standards also should be made in the fourth full paragraph on page II-2. Furthermore, a reference is made to the salinity program "assisting the Lower Basin States to meet salinity standards". The salinity standards were established and adopted by all the basin states and are met under a basin-wide approach, not just by the Lower Basin.

Environmental Protection Agency, Letter

Response: These changes have been made in the document.

Issue 24: Table II-2 should be titled "Flow-weighted annual average salinity at Imperial Dam". The discussion of meeting the numeric criteria (first full paragraph) should also discuss anticipated frequency of compliance under the 1990 Plan of Implementation.

Environmental Protection Agency, Letter

Response: These changes have been made in the document.

Issue 25: We suggest that the farmers have a greater input into the planning of this project than they have been afforded to this point. They are the ones that will be shouldering the problems and responsibilities along with some great financial obligations. This project should not move forward until the many problems have been worked out with all parties. If this program is to reduce salinity, it should have as its main emphasis reducing salinity in the rivers rather than providing habitat for wildlife.

The Resource Development Coordinating Committee, Letter
Clyde Magnusen, Letter
Utah Farm Bureau, Letter
Gale Jorgensen, Emery County Hearing
Gene Johansen, Emery County Hearing
Sherrill Ward, Emery County Hearing
Clyde Magnusen, Letter
Montell Seely, Letter

Response: Many public meetings have been held over the past decade to obtain input from the public at the local level. With the input from the water users and data obtained over the course of the study, the planning report/environmental impact statement (PR/EIS) has been prepared. The purpose of this document is to present a proposed plan and to consider the potential environmental impacts. After the project has been approved and authorized by Congress, negotiations will commence with the water users in the proposed sub-units. During these negotiations, final designs will be agreed upon for laterals, ponds, and culinary connections.

Issue 26: The PR/DEIS discusses the creation and maintenance of wetlands for off-site mitigation "for the life of the project" (page IV-22). The mitigation should be maintained for the duration of the impact rather than "for the life of the project."

Environmental Protection Agency, Letter

Response: This change has been made in the document.

Issue 27: IV-20 says that 330 acres of wetland will be lost as a result of the project. From what I understand, you will buy that many acres along with a full water right someplace else in the area and create 330 acres of wetland so that there will be no net loss in wetland. That doesn't make sense. The 330 acres of wetland that is managed by the Division of Wildlife Resources will always continue to dump salt into the river. You're not going to reduce the salt unless you dry up some wetland!

Montell Seely, Letter

Response: Mitigation for impacted wetlands and wildlife areas will be constructed in a location where the salinity contribution will be less than the contributions from irrigated land.

Issue 28: Page IV-20 indicates that the wetland mitigation for the entire unit comes from Cottonwood Creek. That 380 acres would be purchased along with 40 acre-feet of water. The board objects to the entire mitigation being placed on Cottonwood Creek, which represents only 20 percent of the planning unit. The plan, if implemented, would eliminate three farm families and significantly alter the operations of 10 other farm families. We object to the recommendation that a full water right is required. The board recommends that the mitigation be spread across the unit. Any water purchased and transferred from Cottonwood canals will be required to leave 12 percent in the system to cover distribution losses.

Cottonwood Creek Consolidated Irrigation Company, Letter
Ross Huntington, Emery County Hearing
Ross Huntington, Letter
Clyde Magnusen, Emery County Hearing
Clyde Magnusen, Letter
Gene Johansen, Emery County Hearing
Gale Jorgensen, Letter
Gale Jorgensen, Emery County Hearing
Jay Humphrey, Emery County Hearing
Utah Division of Water Resources, Letter

Response: The mitigation for environmental impacts will consider several areas for possible mitigation. These areas include but are not limited to: Desert Lake, Three Forks, and Cottonwood Creek as a location for possible mitigation implementation. The selection of an area for mitigation will be determined upon project authorization by Reclamation, Utah Division of Wildlife Resources, and Fish and Wildlife Services (Service). Lands and water will be purchased from willing sellers.

Issue 29: Any mitigation package for implementation of the salinity reduction project should be jointly planned, funded and implemented by the BOR and SCS, rather than individually undertaken by each agency. This will reduce duplication of efforts and cost. The BOR should be the lead agency in performing mitigation for the project.

Jody Williams, Utah Power and Light Company, Letter

Response: Mitigation for the off-farm portion of the project will be funded by Reclamation. The SCS, Service, and the State of Utah will be involved in the determination of the best possible mitigation plan. Due to agency regulations, USDA cannot participate in the funding of a mitigation program; SCS has, however, agreed to seek Congressional authorization for funding if the volunteer replacement program fails to replace values foregone.

Issue 30: This project's potential for impact to wildlife resources and wildlife habitat concerns us. Wildlife Resources believes that some of the areas in the Environmental Impact Statement do not adequately provide for lost wildlife habitat. Over 7,000 acres of wetlands will be lost due to this project. Wetlands are critical habitat to most wildlife species. In the project area a hundred percent of the 750 species are associated with wetlands. A third of the 232 bird species and a third of the 72 mammal species are associated with mesic meadow habitats, the type that will probably be lost. And yet the EIS proposes to mitigate for 330 acres of these 7,000 acres of wetlands, 330 acres, all farm impacts . . . proposed to be mitigated by the Reclamation. At this time, we do not believe the DEIS adequately addresses or mitigates for the potential impacts to the state's wildlife resources, as described in the Coordination report.

Utah Division of Wildlife Resources, Letter
Ken Phippen, Carbon County Hearing

Response: The estimated loss of 7,000 acres of wetland refers to on-farm aggregate acres of land that would be impacted by the project. These acres fall under the voluntary replacement program conducted by the Soil Conservation Service. SCS has agreed to seek approval for mitigation above and beyond the voluntary replacement program, if needed.

Issue 31: UP&L owns property in the vicinity of the Three Forks on the San Rafael as well as several thousand acres of land adjacent to the San Rafael River between the Three Forks area and the confluence of the San Rafael with the Green River. Much of that property is currently under lease to private entities. While the proposed wetland mitigation property is not explicitly identified in the Draft EIS, UP&L believes that its land is some that would be considered for wetland

mitigation. UP&L may consider allowing use of its land for wetland mitigation under circumstances meeting its approval if the proposed plan is authorized and funded, and if local agricultural users voluntarily opt to join the salinity reduction program requiring wetland replacement. UP&L's contribution to wetland mitigation could allow farmers who wish to participate in the salinity reduction program the opportunity to do so without taking their privately-owned lands out of production for use as wetland replacement mitigation. Further negotiations would have to set the terms and conditions for use of UP&L's lands as wetland mitigation.

Jody Williams, Utah Power and Light Company, Letter

Response: Reclamation is interested in the Utah Power holdings as well as other areas for potential mitigation. Upon authorization, negotiations would be held to determine the best possible location for mitigation whether it be the Three Forks area or other possible sites.

Issue 32: We support the principle of salinity control but we cannot support the statement as it now stands.

Sherrill Ward, Emery County Hearing
Monteel Seely, Letter
Monteel Seely, Emery County Hearing
Cottonwood Creek Consolidated Irrigation Company, Letter
Ross Huntington, Emery County Hearing
Clyde J. Magnusen, Letter
Utah Division of Wildlife Resources, Letter
Montell Seely, Letter
Gale Jorgensen, Letter
Courtney Guyman, Emery County Hearing

Response: Reclamation/SCS will attempt to respond to the comments on the EIS to clarify the issues and to improve the document. We anticipate that many of the objections to the project will be answered with completion of the final EIS.

Issue 33: UP&L has offered to purchase the North Emery County Water Users Association's water system. If successful, UP&L will turn the system over to Emery County to operate as a special service district.

Jody Williams, Utah Power and Light Company, Letter

Response: Reclamation will work with all entities to ensure that the project is implemented and functioning.

Issue 34: The plan suggests that Reclamation will reimburse canal companies for increased Operation and Maintenance costs to implement the project. The plan then identifies \$11,829 per year to Cottonwood Creek for this purpose. The board objects to this amount as being grossly underestimated. The board recommends that at least one full time employee will be required to administer the program.

The cost of this employee is estimated at \$50,000 per year. In addition, annual maintenance costs on all improvements will be required. The final plan should more adequately address this issue.

Cottonwood Creek Consolidated Irrigation Company, Letter
Clyde Magnusen, Letter
Courtney Guyman, Emery County Hearing
Jay Humphrey, Emery County Hearing

Response: A benefit is derived by canal companies from the construction of the off-farm distribution system. The cost of the off-farm component will be paid by the U.S. Government and the seven western states. A portion of the O&M expenses will also be provided. However, the canal companies will be required to participate in the O&M of the system due to the benefit derived. The numbers in the PR/EIS are estimates based on initial plans and designs. Upon authorization of the project, negotiations will be held to determine O&M costs and ownership of the stockwater pipeline in Cottonwood Creek.

Issue 35: The funding portion of the draft EIS lists spending some 30 percent of the funding, or 9 million dollars, on administration costs. Any business that has to operate on 30 percent overhead is not long in business. If they can't get it down lower than that, they just don't survive.

Courtney Guyman, Emery County Hearing

Response: The Federal Government is required to provide much more than private industry due to regulatory steps and the environmental process. We feel that for an \$80 million project, an overhead of 30 percent is reasonable and in line with the rest of industry. Private engineering and construction firms that work with large projects of \$20 million or more describe their overhead as being typically around 30 percent.

Issue 36: The Cottonwood Creek M&I line is proposed. The board supports the concept but sees a problem with the company's livestock watering system connected to it. When the cities place treated water in the system, the stockmen will have to pay for treated water to water livestock. The board will insist that the livestock watering system remain a raw water system. We recommend that the two systems remain independent. Will they be operated year round? Who will be responsible for O&M? Who will own the finished pipeline? Will the Reclamation turn over the ownership to the Castle Valley Special Service District (CVSSD) so it could be used for finished water transmission? Who will provide the O&M for the pipeline? Pages IV-16 and IV-54 indicate that CVSSD would be expected to do this. That may create some legal problems if we do not own the facility. Will the price of materials used during construction be suitable for the pressure we would need for treated water deliveries to the towns, and will it be NSF-approved for carrying treated culinary water? The proposed plan calls for several inter-connects from the Cottonwood Creek Line to the existing livestock watering

system. When we build the new water treatment plant, this would then require that treated water be delivered to the livestock lines. This would be unacceptable to us and to the stock watering system.

Castle Valley Special Service District, Letter
Darrell Leamaster, Emery County Hearing
Cottonwood Creek Consolidated Irrigation Company, Letter
Clyde Magnusen, Emery County Hearing

Response: Negotiations will be held with the Special Service district, Reclamation and CCCIC to determine ownership and O&M costs. Upon project authorization, these details will be worked out.

Issue 37: I am Dale Mathis. I am the president of the Price-Wellington Distribution System from the Price-Wellington Canal. I am also in favor of the salinity program. I have some reservations about the winter water systems. I am out there on the Carbon-Emery County line on kind of a flat valley. I have seven ponds. Right now I think it would be more feasible to put a pipeline out that far than it would be to have a water pond system with a frost-free device for the cattle to drink out of.

Dale Mathis, Carbon County Hearing

Response: Upon project authorization final planning can be made and details worked out. Alternative designs will be considered if the costs are no more than the proposed costs in the PR/EIS.

Issue 38: Ponds lined with hypolon seem to work well with the exception of a problem with muskrats chewing their way through the liner. Mira-font watering devices do not seem to work in this area--with the algae and sediment problems, they plug up. They are very time-consuming and costly to maintain and keep in operation. I doubt that the contributing factor of a livestock winter watering pond would contribute much to the salt load.

Boyd Marsing, Carbon County Hearing
Gale Jorgensen, Letter
Courtney Guyman, Emery County Hearing
Darrell Leamaster, Emery County Hearing
Gale Jorgensen, Emery County Hearing
Cottonwood Creek Consolidated Irrigation Company, Letter

Response: Under the proposed winter water option of the project, stockwater ponds would be improved to be able to hold sufficient water for winter watering. Ponds have been improved in some areas with liners and have proved to be successful. If farmers choose to participate in the project, their ponds would be improved and they would be responsible for O&M of the pond. Alternative pond and watering systems may be installed at the option of the farmer if the cost does not exceed the amount of the proposed plan.

Issue 39: The government constantly changes the rules. We have learned the hard way--from sad experience--that the government will change the rules at will.

When things are not going to suit the powers that be, they change the rules. And that's what we are in for if we sign up for this salinity project. We might think we have a contract, but out of the clear blue sky the government will change the rules. The farmer can't change the rules but the government can. Case in point: The Reclamation Reform Act. We thought we had a binding contract with Reclamation when we did the Joe's Valley (Emery County) project. Not so. The Reclamation Reform Act changed the rules, and that is exactly what will happen with this salinity project.

Montell Seely, Letter
Utah Farm Bureau, Letter
Sherrill Ward, Emery County Hearing

Response: This comment is insightful and very true. The government (Congress) can change the rules by making new laws or changing old ones. But there are broader issues to consider. When the salinity problem was first identified, the EPA and others proposed regulating salinity much like an industrial waste discharge. Reclamation and the Basin States proposed an alternative that recognized a better, more cost-effective way to control salinity. This proposal became the Salinity Control Program, a cooperative program with farmers that is heavily cost shared by the State and Federal governments. The State and Federal governments contribute to the program because public lands and public projects are responsible for over half of the salinity problem. If the Salinity Control Program fails, it would be a simple matter for the EPA to regulate irrigation return flows as industrial waste water discharges. This would place the full burden of cost on the farmers. The government has already passed nonpoint source control laws for agricultural use of fertilizers, pesticides, and herbicides. The trend is clear. Either we, the agricultural community, find a way to control salinity or it will be done for us.

Issue 40: Your statement of the irrigation practices of the area, "During the spring runoff excess water is used causing deep percolation and increasing the salt run off into the San Rafael etc, etc.". This does not necessarily apply to the Cottonwood Creek. Cottonwood Creek through the Emery County project and industrial and increased municipal water have removed 33,000 acre feet of water from the Cottonwood system. There is no mention of the salt reduction effort in the Draft EIS. Our records show that the Cottonwood Creek contributed 34,392 tons of salt into the San Rafael in the year 1987-1988; 25,929 tons, 1988-89; 24,093 tons in 1989-90; and 13,567 tons in 1990-1991.

Cottonwood Creek Consolidated Irrigation Company, Letter

Response: While the fact that a great deal of salt is no longer contributed due to water being used now by the power industry, it is still the goal of the salinity project to improve the irrigation efficiency of the remaining farms in the area. Text has been added in Chapter I to discuss the transfer of water from irrigation to industry.

Issue 41: The plan lists two concerns previously expressed by Cottonwood Creek, and states that "both issues are addressed in the preferred plan. The board reminds the preparers that the issue of storage in the Joe's Valley Reservoir has

not been addressed at all. The board feels that Cottonwood Creek is being discriminated against since it is the only unit with storage restrictions. The board feels that distribution of project water to project lands will be almost impossible to control and certify under the requirement of the RRA. The board recommends that storage be made available. We recommend that the final plan call for a change in Reclamation policy so that water distribution can be made without RRA restrictions.

Clyde Magnusen, Letter
Cottonwood Creek Consolidated Irrigation Company, Letter
Courtney Guyman, Emery County Hearing
Jay Humphrey, Emery County Hearing

Response: The purpose of the Salinity Project is to increase irrigation efficiency and thereby reduce the amount of salts contributed to the Colorado River. Implementation of the salinity program would not affect the operation of Joe's Valley Reservoir. It also would have no effect on the distribution of Project water to Project Lands. Water distribution would continue as it has historically. Storage cannot be provided under this project. We consider this project to be viable due to its lower cost for salt removal. By adding the additional costs of providing storage we feel the project would no longer be considered cost-effective. This project is voluntary and would not be forced on any individual or organization. Any areas that do not wish to participate in the program would be removed from the plan.

Issue 42: The Draft EIS needs to be changed in reflect UP&L's uses for its leaseback water. The leaseback water is retained as a cushion for continued plant operation during extended droughts, such as the one ongoing in Emery County. Only in non-drought years when the projected water supply is surplus to the steam electric generating plant needs does UP&L offer water shares for lease back to Emery County irrigation companies. For the past two years, UP&L has not offered any water for lease back to irrigation companies in Emery County as it has all been allocated for existing steam electric generation plant use. UP&L's current plans do not include using the leaseback water for an additional generating unit at either the Hunter or the Huntington steam electric generating plants.

Jody Williams, Utah Power and Light Company, Letter

Response: The discussion of Utah Power's leaseback water has been changed in the EIS to reflect the current water uses.

Issue 43: My question: Is this a salt removing project or is it for preservation of man-made wetlands and preservation of wildlife habitat? We have no objection to salt removal. We have no objection to efficient methods of using our water. But you're asking that we give land for wetlands, and this is kind of foolish. You want that wetland to have a full water right but you want all the irrigators to cut down on the use of the water and it's the wetlands that are producing the salt. Does that make sense? Not to me.

Gene Johansen, Emery County Hearing
Clyde Magnusen, Emery County Hearing
Gale Jorgensen, Emery County Hearing
Lyle Bryner, Carbon County Hearing

Response: **The purpose of the Price-San Rafael study is discussed in the Summary Section under the "Problems and Needs" and the "Existing Conditions" sections. In order to implement the projects under the Colorado River Water Quality Improvement Program, the National Environmental Policy guidelines must be followed. This includes preparing an Environmental Impact Statement to discuss the impacts and mitigation of the proposed project. Environmental concerns must be discussed prior to implementation of any resource management project.**

Issue 44: Making only "reasonable" efforts to avoid disturbance to the golden eagle is not good enough and could constitute a violation of the Migratory Bird Treaty Act. (EIS, p. IV-20)

Southern Utah Wilderness Alliance, Letter

Response: **The word "reasonable" will be removed and Reclamation will commit to abide by the Migratory Bird Treaty Act to ensure the eagles are not disturbed.**

Issue 45: The CVSSD also operates the pressurized secondary irrigation systems for Castle Dale, Orangeville, Huntington, Cleveland and Elmo. They take their water deliveries from the canals that will be involved with the elimination of winter water. These systems are used to water lawns, shrubs, and gardens in the communities. They often demand water earlier in the year (April 1st) and later in the fall (Oct 31st) to water these items. The EIS does not really define when the winter water will be taken out of the canals. Will this decision be made by the local irrigation company, or will it be mandated by Reclamation? Will we be given consideration for an extended watering schedule with the secondary irrigation systems?

Castle Valley Special Service District, Letter

Response: **Water delivery schedules would continue to be set by the local irrigation company. These deliveries would be made based on the needs of the water users. As the Special Service District is a member of the irrigation company, water would be available throughout the residential irrigation system.**

Issue 46: The planning report has ignored all complications that the proposed plan has with local water rights.

Cottonwood Creek Consolidated Irrigation Company, Letter

Response: **The proposed salinity project is voluntary and would not require any holder of water rights to lose control of those rights. Conflicts in water rights cannot be solved in this document, but must be taken care of by the Division of Water Rights.**

Issue 47: Pages S-9 and IV-3 - The DEIS presents some confusing language regarding Public Law 92-500, the Federal Water Pollution Control Act (FWPCA). On page S-9, it states that P.L. 92-500 "sets forth a public policy of nondegradation

of water quality not governed by traditional economic evaluation, but rather by the accomplishment of the objective at least cost to the Federal Government per ton of salt removed." On page IV-3, it states that the law "sets forth a public policy of nondegradation of water quality, using a criterion of least cost to the Federal Government (cost per ton of salt removed)." The language needs to be revised to: 1) clarify the objective of the FWPCA "to restore and maintain the chemical, physical, and biological integrity of Nation's waters" (Sec. 101(a); 2) clarify that 40 CFR Part 131 presents the federal regulations which the states must follow in implementing antidegradation requirements; and 3) remove language about "traditional economic evaluation" and "least cost to the Federal Government per ton of salt removed" (these references are to the salinity control legislation).

Environmental Protection Agency, Letter

Response: **The document has been revised to provide a clearer explanation of the laws that regulate salinity control.**

Issue 48: Project implementation will reduce inflows to Olson by 1.350 cfs, or approximately 20 percent annually. Loss of undetermined amount of wetland-riparian habitat due to reduced inflows, causing a conversion of wetland to upland habitats. On page V-14 under Waterfowl, casual reference is made to Olson slough as providing limited waterfowl use and hunting. We believe this is a gross underestimate of the values Olson Reservoir and its associated cattail marsh provide for waterfowl and shorebirds. Olson Reservoir is one of the single most important waterfowl areas on public land in southeast Utah. We feel the potential impacts identified for Olson are significant and should be fully mitigated. We recommend the BOR work with BLM to develop a mitigation project that will maintain or enhance through habitat and project management, the wildlife values presently recognized from the Olson Reservoir/wetland habitat area. We have included as Enclosure 1, an option paper which discusses possible alternatives for mitigation at Olson. We request technical assistance from the BOR to complete a feasibility study on alternatives proposed in this paper as a first step toward developing a viable, effective mitigation project. BOR initiate a monitoring study on the Olson Reservoir/wetland area using large scale, color infrared photography to quantify and map wetland habitat types present before project implementation. This baseline data can be repeated after project completion to estimate actual project effects.

Bureau of Land Management, Letter

Response: **In order to avoid impact to the Olson Reservoir area, we propose that the immediate surrounding irrigated area not be included in the salinity program. This would avoid affecting the wetland habitat area.**

Issue 49: Recommended addition to be added to the August 1991 draft, after the fourth paragraph, Chapter I, page 4, under the heading: PRICE SAN RAFAEL DEPLETIONS: "The Emery County Reclamation Project (Joe's Valley Dam and Delivery System) has resulted in approximately 48,400 acre-feet of water from the Cottonwood, Huntington, and Ferron water sheds being converted from agricultural to industrial use in the Utah Power and Light (UP&L) electric generation plants. At present, UP&L is using about 35,000 acre-feet of water, resulting in a decrease in the salt loading to the Colorado River by about

36,750 tons. When and if UP&L uses their full water rights, the salt loading will be reduced an additional 14,080 tons. This reduction of nearly 50,000 tons of salt loading to the Colorado River has been accomplished because of the Emery County Reclamation Project, and at not cost to the United States. (for further detail see Chapter IV). The Emery County Reclamation Project was made possible by the stockholders of the Cottonwood Creek Irrigation Company and the Huntington-Cleveland Irrigation Company, releasing that portion of their decreed water rights to the United States, necessary to make the project possible. Except on very wet years, there is unused capacity in Joe's Valley Reservoir and in the reservoirs of Huntington Creek that is being and can be utilized for exchange purposes in administering the project water. Utilization of this unused capacity for short term storage of primary water and the water saved through the salinity irrigation management and conveyance improvements can be done with no additional costs to the United States, and only nominal O&M costs to the project users. This procedure will increase the participation and effectiveness of the salinity project in the Huntington and Cottonwood sub-units.

Emery County Water Conservancy District, Jan 20, 1991

Response: We recognize that a large portion of water rights has been turned over to industry for power generation, which has resulted in salt savings. Although a reduction in salt contribution has occurred, it is still the intent of this project to further reduce the amount of salt contribution from the area by improving upon irrigation methods. Text has been included in Chapter 1 to address the salt saving from the UP&L water rights.

Issue 50: The EIS fails to consider the impacts of the proposed project on the wilderness suitability of the Mexican Mountain and Sid's Mountain WSA's due to diminished stream flows in the San Rafael River. Also the EIS fails to consider whether implementation would adversely affect the eligibility for the San Rafael River to be designated "Wild and Scenic."

Southern Utah Wilderness Alliance, Letter

Response: According to the "San Rafael Proposed Resource Management Plan/Final Environmental Impact Statement" prepared by the Bureau of Land Management, we feel that a reduction in flow would not adversely affect "Wild and Scenic" eligibility. In the Resource Management Plan, under the section "Appendix J, Wild and Scenic River Study Segments and Potential Classifications" page A-84, it states: "There are no specific requirements regarding the length or flow of an eligible river segment. Length and flow are sufficient if they sustain or complement the outstandingly remarkable values for which the river would be designated."

Issue 51: The EIS should address the opportunities for constructing stockwater ponds in non-saline areas to provide wildlife/wetland habitat. In addition, the

ponds should be constructed in upland areas, not existing wetland/riparian areas. Consequently, criteria for pond locations and for wildlife/wetland habitat (including operation and maintenance) should be included.

Environmental Protection Agency, Letter

Response: Ponds will be fenced to stop livestock access and preserve the ponds for wildlife. However, ponds must be located near the livestock to fulfill the water users needs.

Issue 52: The statement, "Although hunting on private lands might be affected during the construction phase, because the area would remain in agriculture-associated habitat, there would not be a significant long-term impact on upland game and big game species," does not agree with Division of Wildlife Resources and the United States Fish and Wildlife Service (Service) conclusions (Coordination Report). Upland species such as pheasants will be impacted dramatically.

Utah Division of Wildlife Resources, Letter

Response: SCS disagrees that there will be a dramatic impact. SCS wildlife biologists in the other salinity control areas of Utah, Wyoming, and Colorado were contacted. There have been no reports of significant changes as a result of the project in upland game hunting in these areas. Salinity Control program implementation has been going on for up to 11 years in some basins.

DWR recently stated in the media, at the beginning of the 1992 pheasant season, that pheasant populations were generally up statewide, and specifically mentioned that the population in the Uinta Basin had increased. Information from the SCS Monitoring and evaluation program in the Uinta Basin does not show a significant impact on the pheasant on upland sites as a result of program implementation.

The Service, in an Environmental Assessment for installation of a 6-mile irrigation pipeline--(all farms along the route will be changed to sprinkler irrigation), in Uintah County (within the CRSC project area), from Pelican Lake to Ouray National Wildlife Refuge did not identify recreation as a concern. In addition, the acres impacted and displayed in the DEIS are a "worst case" estimate. Recent evaluations in the Uinta Basin have shown that over 40 percent of the project has been implemented; however less than 10 percent of the worst-case impacts in the Uinta Basin EIS have occurred.

Based on the analysis of the above data, SCS has determined there would not be a significant impact on pheasants as a result of implementation of the salinity program.

Issue 53: I own and operate about 1000 acres on the Cottonwood Creek. I crop about 200 acres of it but I irrigate about 500 acres of it and my cattle harvest it

and everything else that grows. I have more fences than I can maintain now without maintaining another fence to keep them out of wildlife habitat.

Clyde Magnusen 1/20/92
Clyde Magnusen, Emery Hearing

Response: Participation in the program, both the irrigation improvement and the wildlife habitat replacement, is voluntary. No one would be forced to install and maintain fences for improvement of wildlife habitat.

Issue 54: The EIS fails to adequately quantify how much salinity comes from natural sources in the project area versus agricultural-related sources and how much salt will be contributed from the wetlands.

Southern Utah Wilderness Alliance (SUWA)
December 23, 1991

Response: On page I-3 of the Draft EIS the following information is provided, "Of the two basins' annual estimated contribution of 430,000 tons of salt, more than half (244,000 tons) is attributable to irrigation practices." Since the exact location of acres that can be purchased for mitigation are not known, it is impossible to know how much they would contribute to salt loading. However, if these acres are located in the flood plain they would contribute little or no salt since salt underlying the flood plain is presumed to already be leached.

Issue 55: After reviewing the DEIS, our greatest concern is with the proposed on-farm mitigation plan. Projected wetland losses for full project implementation are 7,718 acres. The loss of these wetland habitats will result in loss of waterfowl nesting, brooding and resting habitats; loss of habitats for upland game and mule deer; loss of habitat for long-billed curlew, a Category 2 candidate species; loss of nesting and feeding habitat for northern harrier and whitefaced ibis; feeding habitat for loggerhead shrike and all migratory nongame birds of management concern in the United States; loss of habitat supporting prey base for raptors including northern harrier, rough-legged hawk and American kestrel; and a loss of over \$3,959,843 per year (1985 dollars) spent by hunters hunting in the project area of Carbon and Emery counties (refer to page 24, Table XIV in the Coordination Report). The document suggests a voluntary program for on-farm mitigation but does not provide details. At the minimum, the document must provide a clear description of the program, expected benefits, and resulting wildlife habitat values replaced. Without clarification of this program, the Division must consider these listed impacts as unmitigated impacts.

Division of Wildlife Resources, 12/20/91
Ken Phippen, Carbon County Hearing

Response: A description of the voluntary program for replacement of wildlife habitat converted during installation of the on-farm program was included in the Draft EIS. In the Final EIS this section has been expanded and is contained in the description of Resource Protection Alternative under the heading *Fish and Wildlife Habitat Replacement, On-Farm*.

Expected benefits and resulting wildlife habitat values replaced cannot be described because this is a voluntary program and there is no way of knowing how many landowners would choose to construct or enhance wetland to replace habitat values.

The loss of over \$3,959,843 is not principally attributed to hunting in the project area. On page 24 of the Coordination Report attachment, \$2,551,430 is attributed to "Non-consumptive Wildlife Oriented Recreation" which is defined in the cited reference as "feeding, photographing or observing" wildlife. USDA does not agree that all consumptive and non-consumptive wildlife expenditures would be lost as stated in the report. The amount of land to be affected by the project is only about 2 percent of the land in the county. It is all private land while most of these two counties is public land; therefore, access for hunting or for non-consumptive wildlife activities on land affected by the project is limited to those receiving permission from the owner. It is true that wildlife using this private land would be impacted. However, some impacts would be positive while some would be negative. Eighty percent of the major impact--loss of wetlands--would take place on agricultural fields that are mowed or grazed. As a result, the habitat value of these wetlands is low when assessed by the Habitat Evaluation Procedure used by the Fish and Wildlife Service.

Issue 56: The cost-benefit analysis should incorporate a component to quantify the foregone benefits to the consumptive wildlife users who would be adversely affected by project implementation. (EIS, p. V-37)

SUWA, 12/23/91

Response: Chapter V, *Recreation, Impact and Analyses* shows no appreciable change in wildlife oriented recreation. Therefore, there is no value on foregone benefits.

Issue 57: I would also like to recommend that the wildlife litigation all be voluntary on the system, and I feel the farmers have done as excellent a job as they could on all the wildlife. And I think that the wildlife problem now is the predators, not the farmers. And I think that the salinity program won't have that much of an effect on wildlife. I will be making a written comment later. Thank you.

Dale Mathis, Carbon County Hearing
UP&L
Tracy Behling, Emery Hearing

Response: The salinity control law as amended states that replacement of fish and wildlife habitat will be voluntary.

Issue 58: The section on impacts of on-farm measures appear on one hand to recognize the significant changes in wetland habitat values which will result from implementation of the on-farm measures and then attempts to rationalize that these values are not important. Also, monitoring information from the Uinta

Basin Unit is used to support a conclusion that "the value changes may not be of a magnitude that would be anticipated by the changes in acreage" (top of page V-18). Then the value of the Uinta Basin monitoring is discredited because of weather patterns and relatively few years of data (footnote 5, page V-18). The assessment of value changes needs to be more conclusive and scientifically supportable. The EIS needs to properly recognize that resident and migratory species which are the emergent wetland habitat types either solely for a critical life history requisite such as feeding during migration or breeding, will be significantly adversely affected by project implementation. Also, the DEIS needs to clearly state that the on-farm voluntary replacement program proposed is inadequate to replace much, if any, of emergent wetland habitat which could be lost. Based on the information in DEIS Attachment III and Utah Division of Wildlife Resources 1990 *Fauna of Southeastern Utah and Life Requisites Regarding their Ecosystems* (publication number 90-11), some species which exist in the project area and rely on emergent wetlands either solely or for a major life history requisite include: western terrestrial garter snake, Great Basin spadefoot toad, Great Plains toad, Woodhouses's toad, northern leopard frog, white-faced ibis (a Utah high interest species), northern pintail (a Utah high interest species), american widgeon (a Utah high interest species), green winged teal, (a Utah high interest species), cinnamon teal (a Utah high interest species), blue-winged teal (a Utah high interest species), ferruginous hawk (a Utah high interest species), northern harrier, ring-necked pheasant (a Utah high interest species), sora, Virginia rail, snowy plover (a Utah high interest species), mountain plover (a Utah high interest species), semipalmated plover, killdeer, lesser golden plover, back bellied plover, black-necked stilt, American avocet, pectoral sandpiper, least sandpiper, common snipe (A Utah high interest species), long-billed dowitcher, marbled godwit, long-billed curlew (a Utah high interest species and a Federal Category 2 candidate species), Wilson's phalarope, short eared owl, marsh wren, red-winged and yellow-headed blackbirds, Brewer's blackbird, montane shrew, montane vole, meadow vole, muskrat, and western jumping mouse. Many of these species are prey species for raptors and other carnivorous animals. The population trend of several of these species is known to be declining. Undoubtedly, there are others. Why was the long-billed curlew (a Federal Category 2 candidate species) not mentioned in the discussion of species impacted? Populations of this species are known to be declining because of habitat loss. Also, while the FWCR (PR/DEIS Attachment III) points out that populations of the northern harrier (marsh hawk) and the whitefaced ibis (both species of management concern nationally) would be decimated in the project area as a result of project implementation (page 25), no mention is made of impacts to these species. Lack of depth and consistency in the PR/DEIS disclosure of wildlife effects (such as on page V-18) commensurate with the FWCR is a major NEPA oversight to be corrected.

EPA, 12/20/91
Utah Division of Wildlife Resources

Response: (See response to EPA letter)

Issue 59: Page IV-56 - the second paragraph indicates salinity monitoring of basin outflow would be measured at USGS stations. This seems to contradict the discussion of USGS gauging stations on page I-9 which indicates a broader monitoring network. In order to document actual salinity improvement, upstream monitoring will also be needed in order to achieve valid comparison. Upstream and downstream pre-project water quality sampling needs to be established prior

to project initiation. Is this sampling data already being collected by USGS, Utah Department of Environmental Quality, and consultants? The third full paragraph states that the monitoring and evaluation (M&E) plan for the Unit "would be developed". There are also some general discussions of M&E plans for wildlife habitat. The fourth paragraph indicates the U.S. Fish and Wildlife Service Habitat Evaluation Procedures (HEP) would be used in monitoring. There needs to be at least an acceptable "framework" M&B plan in the EIS (this becomes even more critical because of the Bureau's plans to underwrite the on-farm wetland losses). It needs to clearly describe the methodology for tracking wetland types, acres, and values lost and gained. It needs to be clear that an appropriate HEP species model (developed by an inter-agency HEP team) will be used for each wetland type (rather than one model for multiple cover types). The framework plan needs to also contain the schedule for having technical inter-agency concurrence on the detailed M&E plan prior to the development of any on-farm salinity control plans and contracts.

EPA
Cottonwood Creek Consolidated Irrigation Co. (CCCIC)
CCCIC Board Response

Response: **The Monitoring and Evaluation section has been revised in the Final EIS to indicate that information from GS and Department of Environmental Quality gaging stations would be used. The project would be evaluated based on the change in salinity resulting from the project. This change can be assessed by measuring downstream water quality only. Preproject downstream levels have been established.**

Issue 60: The Stowell Irrigation Company located in Spring Glen, Utah would like to be included in the Price River Salinity Program. The Stowell Irrigation Company supports the program and believes it will improve the efficiency of delivery of water and irrigation practices along with reducing the salt loading of Price River in the Spring Glen area.

Jack Soper, 12/28/91
Stonewell Ditch Canal Company, 1/28/92
Dale Wilson
Spring Glen letter
Rudolph Bruno, Stowell Ditch Canal Co., 12/18/91
Jack Soper, Stowell Irrigation Co., 12/28/91

Response: **The Stowell Irrigation Company was included in the 1,500 acres of eligible irrigated land outside the evaluation units that are referred to in the introduction the DEIS. To reinforce this inclusion, Stowell Irrigation Company has been added to the Final EIS as an example of areas outside of evaluation units that are included in the program.**

Issue 61: The EIS fails to adequately identify impacts of the streamflow reductions associated with project implementation on the roundtail chub and other non-game fish species. Inventories should have already been completed to determine the range, habitat needs, and other potential impacts of the proposed

project on the chub and other fish species. Failure to complete such inventories would render the federal agencies unable to adequately describe the affected environment and to analyze potential impacts, thereby violating NEPA.

SUWA, 12/23/91

Response: SCS contacted the Utah Division of Wildlife Resources (UDWR) early in the planning process to obtain information on fish inventories in the project area. The roundtail chub was identified as the species of concern. The chub was subsequently classified as a category 2 species under the Endangered Species Act. A literature search showed very little information specific to the roundtail chub. A recent check with the Service revealed no new information. SCS prepared a specific evaluation addressing streamflow impacts as they relate to the chub. The initial draft was reviewed by the Service and comments reviewed resulted in a more detailed analysis of streamflow impacts. The analysis was published in the DEIS. SCS showed that there would not be a significant impact on streamflows resulting from the project implementation.

Issue 62: The EIS does not define the flood plain area which is called for in the mitigation. We suggest that the farmers have a greater input into the planning of this project than they have been afforded to this point.

Gayle Jorgensen, Emery Hearing
The Resource Development Coordinating Committee

Response: **The flood plain area referred to in the section, "Private Land Habitat Replacement Opportunities" is identified as the best opportunity for construction or enhancement of wetlands. However, no work can be done in these areas without the decision by the landowner to participate in the program. Therefore, the area cannot be defined, but farmers would have input into planning before anything is done.**

Issue 63: In the cumulative impact analyses section, it is admitted that the cumulative impacts of this project on the roundtail chub are unknown. Therefore, we request that the federal agencies work with the Utah Division of Wildlife Resources and promulgate a mitigation plan to ensure adequate protection for the chub.

SUWA, 1/23/91
BLM, Moab

Response: **The cumulative impact of depletion is unknown because detailed information on the life requisites of the roundtail chub is not available. However, Ferron Creek already has a recorded flow that varied from zero for 49 days to 900 cfs for 18 days. Implementation of the project would not create this degree of variability; therefore it would not have a significant impact on the roundtail chub.**

Issue 64: Using general estimates taken from pages IV-16 and IV-50, it is estimated that there will be a cost to the participant of about \$60.00 per acre per year. This cost has been obscured in the planning effort. The board recommends that the planners make sure that the participant understands the cost of the project that will be borne by them and provide a proper benefit ratio for

the on-farm costs. The salinity program will cost the farmer \$30,000 and will benefit the downstream users. Farmers are subsidizing the salt removal from the Colorado River.

Clyde Magnusen 1/20/92
Montell Seely 1/20/92
CCCIC Board

Response: **The feasibility of all subunits was evaluated as part of the planning process. Annual on-farm benefits were higher than annual on-farm costs with both proposed alternatives for each of the evaluation units with the exception of flood irrigation systems on the Cottonwood Evaluation subunit. Costs and benefits used were general. Before installation of a particular system, SCS planners would present specific costs to landowners. The landowners would make the decision whether or not to participate in the program.**

Issue 65: If the project is implemented as recommended it will increase the depletion to the Colorado River by about 25,000 acre-feet per year. In the wetland and wildlife mitigation, there is a \$10.91 cents per acre foot charge to be paid for depletion to the Colorado River by an undetermined entity. We need to know who this responsible party is for paying before we could accept the plan 1. Initiate a long-term monitoring study using large scale, color infrared photography. Map and quantify riparian habitat types present to be compared with similar data collected after project completion. 2. Require complete mitigation for loss of riparian habitat resulting from project, as documented by the monitoring study. (Attachment III) states: "SCS has agreed to require such funding from project recipients." This confusion should be rectified in the final EIS. Reclamation commitments to seek funding to assure that the payment is made should be in the environmental commitments in the final EIS. Furthermore, Tables IV-8 and V-1 appear to mislead the reader with regard to threatened and endangered (T&E) species. What does the term "compliance" for T&E species mean? Presuming that the term "compliance" means the project will comply with the T&E requirements seems to conflict with the statement on page IV-24 which indicates that the depletion payments will be made by an undetermined entity. If the entity cannot be determined how can the PR/DEIS indicate that compliance has been accomplished?

EPA
CCCIC Board Response
Division of Water Rights
Jay Humphrey, Emery Hearing
BLM, Moab
Montell Seely 1/20/92
Utah Division of Water Resources 1/92
Utah Division of Wildlife Resources 12/20/91
EPA
Ken Phippen, Carbon County Hearing

Response: **The Service has agreed that planning on this project can continue without identification of the entity responsible for paying the depletion charge. USDA has agreed that no implementation would take place until the charge is paid. The statement on Page 10 of the Biological Assessment (Attachment III) is in error. The commitment that the payment of the depletion charge would be done before implementation has been inserted in the Environmental Commitments Attachment.**

Table IV-8 has been changed to "Depletion of water may endanger fishes. Offset by depletion payment." In Table V-1 the following statement will be added: "no implementation will be carried out before the depletion charge is paid."

Issue 66: Define Price Canyon. The statement "sport fish are nonexistent from Price Canyon to Farnham Dam" is incorrect. Sport fish occur in the Price River down to the first diversion at the golf course. Upper parts of Grassy Trail (rainbow and brown trout), Gordon and Willow creeks (cutthroat trout) contain game fish. Roundtail chub are classified as a Category 2 candidate species.

Division of Wildlife Resources 12/10/91

Response: The text has been revised to reflect the information contained in this comment.

Issue 67: What is the target irrigation efficiency for the project?
SUWA, 12/23/91

Response: The target efficiency on sprinkler irrigated acres is 65 percent. The target efficiency on surface irrigated acres is 55 percent.

Issue 68: The rating system described on page IV-24 paragraph 3 states that the first to receive on-farm funding would be the applicant most willing to implement wetland and wildlife practices. These practices include establishing wetland and wildlife habitat and fencing at a 70/30 cost share and maintenance to keep livestock out. Any land owner found in violation of the contract could be asked to repay all cost shared monies.

Clyde Magnusen 1/20/92
Jay Humphrey, Emery Hearing

Response: Participation in the program is voluntary. The priority given to landowners volunteering to install wildlife habitat improvement is meant to encourage this type of practice. However, there is no compulsion to do so. It is true that if a landowner voluntarily signs a contract to implement and maintain such habitat he can be asked to repay cost-share funds if he does not follow the contract.

Issue 69: The Emery System has two main areas; the Moore system and the Emery Proper system. You have ignored portion of the Moore system and completely ignored the Emery system. The proposed costs of Moore sub-unit seems to be very excessive. We will leave the response to this problem to the irrigation companies involved.

Emery District, 1/2/91

Response: Acreage and costs of individual systems in the DEIS were used only for evaluation. Detailed planning will be needed before accurate cost estimates can be made for acreage of landowners who wish to

participate. However, as stated in the Introduction, "land eligible for participation is not limited to land within the identified subunits."

Issue 70: How long is a farmer obligated to maintain his respective practice? The EIS is ambiguous on this point. Is 25 years or the life of the project, or both? To hold a farmer liable for 25 years is unreasonable. Under the present policy of the ASCS, a person is liable for 10 years for an underground pipeline, and 10 years for gated pipe. In your salinity project, this liability should not be more than 10 years.

Montell Seely 1/20/92

Response: All installed irrigation improvements would be maintained through the evaluation period of 50 years. If improvements needed to be replaced, they would be replaced at the same or greater efficiency to accomplish the same amount of salt reduction.

Issue 71: A fourth of the acreage that will fall under sprinkler irrigation will have to be pumped. The cost of pumping is what? Can anybody tell me how much it's going to cost me to pump water on an acre of alfalfa? Nobody has been able to answer that question other than that production would increase through sprinkler irrigation, possibly a ton per acre of alfalfa, which is worth fifty dollars. And if it costs you fifty bucks to pump the water for that acre you just broke even. If you're one of those lucky fourth of the people that are going to have to pump, I think there's a good possibility you might find yourself out of business before the very near future. Generally speaking, I find the costs as presented in here are too high.

Ross Huntington, Emery Hearing

Response: The average cost of pumping used in evaluation was \$40 per acre. This cost was obtained through interviews with local operators and the Utah Power and Light Co. It would be a decision of individual landowners whether or not they chose to participate if pumping is required to operate a system on their land.

Issue 72: Benefits from this project are questionable because no one knows how long we can put salt on our lands without washing it off before production decreases. If we in this area were cash crop producers this project as proposed may be more beneficial, but we are stockmen. We sell livestock. I can sell my cattle even if they get rained on.

Clyde Magnusen 1/20/92
SUWA, 12/23/91
Clyde Magnusen, Emery Hearing
Clyde Magnusen, Letter
Jay Humphrey, Emery Hearing

Response: The amount of water required to leach salt from the soil depends on the amount of salts in the soil and in the irrigation water and the crop being grown. As a rule, adequate leaching can be accomplished

with an irrigation efficiency of 85 to 95 percent. It is not expected that efficiencies would be that high within this project. However, irrigation water management is an important part of all irrigation improvement.

Issue 73: Another major concern deals with your proposal to treat only 6,430 acres of land under the project. We have 12,000 acres of irrigated land. We are concerned how the land under your proposal is going to be treated when the canals are eliminated and the water use is restricted by limited pipe size on these laterals.

CCCIC

Response: Acreage used in the DEIS was based on the fact that during public meetings local people did not all indicate they wanted to participate in improving their irrigation systems. During implementation, the acreage actually treated would depend on the landowners who chose to participate.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII

999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

FEB 24 1992

Ref: 8WM-WQ

Roland Robison, Regional Director
Bureau of Reclamation
125 South State Street
P. O. Box 11568
Salt Lake City, Utah 84147

Re: Planning Report/Draft
Environmental Impact
Statement (PR/DEIS) for the
Price-San Rafael Rivers
Unit, Colorado River
Salinity Control Program

Dear Mr. Robison:

In accordance with the National Environmental Policy Act (NEPA) and our responsibilities under Section 309 of the Clean Air Act, the Region VIII Office of the Environmental Protection Agency (EPA) has reviewed the referenced PR/DEIS. We appreciate the numerous opportunities we have had to discuss the project and our concerns with Bureau of Reclamation (Reclamation), U. S. Department of Agriculture (USDA), and other federal and state agencies. The preferred plan combines on-farm irrigation system improvements and elimination of agricultural water from open conveyance systems (off-farm) during the winter to reduce salt loading to the Colorado River by about 161,000 tons annually.

While we continue to support the Colorado River salinity control program, we also continue to have concerns with sufficiency of project-specific NEPA documents. In this case, EPA has identified significant concerns regarding the magnitude of projected wetland losses, adequacy of impact disclosure, and the narrow range of action alternatives among other issues. Under the criteria EPA has established to rate adequacy of draft EISSs, we have rated this DEIS as Category EU-2 (Environmentally Unsatisfactory-Insufficient Information). Based on the significant impacts involved, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ) if our concerns can not be adequately resolved. We want to make it clear that EPA's rating is based on the draft EIS before us for review even though we understand that Reclamation has recently committed to seek funding authorization to provide: 1) replacement of wetland losses from on-farm salinity activities if USDA's wetland replacement activities prove to be insufficient; and 2) the payment for flow depletions resulting also from on-farm activities to the endangered fish Recovery Implementation Program in the upper Colorado River Basin if another entity cannot be identified to pay the charge. We believe that

referral of the proposal to CEQ will not be necessary if the specific environmental commitments regarding wetlands (including wetland replacement initiatives of both the Bureau and USDA) and the information on the wetland monitoring and evaluation plan in the final EIS are sufficient.

The preferred alternative would result in approximately 7,718 acres of wetlands converted to upland as worst case. Of this amount, about 330 acres of wetland loss would result from off-farm irrigation system improvements by Reclamation and the remaining losses and/or wetland impairments (7,388 acres) would result from on-farm irrigation improvements. The PR/DEIS indicates that the creation of about 49 acres of "ponds/wetlands" to replace the effects on 7,388 wetland acres is anticipated. EPA is pleased that Reclamation has committed to obtain funding to underwrite the shortfall in on-farm wetland replacement. However, we believe that this does not remove the need for the EIS to more thoroughly analyze additional initiatives for the on-farm program to reduce wetland impacts and/or expand the wetland replacement program, such as: increasing the cost-share rate for wetland replacement practices; offering the public the opportunity to retire lands from agricultural production on a piecemeal basis for wildlife purposes; targeting specific areas for wildlife purposes rather than for salinity control; enhancement, including on federal lands; replacement off-site; and development of wetland replacement and protection opportunities that may exist through working with public and private landholders and agencies in addition to Reclamation, such as the U. S. Fish and Wildlife Service (USFWS), and the Utah Division of Wildlife Resources.

There are only two very similar action alternatives (the Resource Protection (RP) and National Economic Development (NED) alternatives). The RP alternative (the preferred alternative) appears to have the most stream flow depletions and impact to wildlife resources (both upland and aquatic, including wetlands). It appears that the intent to achieve "the greatest reduction in salinity", particularly for the on-farm activities, and other constraints were used to prevent development of a wider range of action alternatives and environmental impacts. We believe that the NED alternative provides a better balance of salinity control versus impacts to other resources. However, even with the Reclamation commitments, we believe that one or both of the action alternatives should be revised to include appropriate additional USDA wetland initiatives, as already discussed, in order to increase the wetland replacement target of 49 acres and otherwise reduce the wetland impacts. The environmental commitments section of the final EIS also needs to reflect these initiatives. Also, the PR/DEIS states that there were attempts to "minimize adverse impacts" (page III-6). We were unable to find how impacts were minimized.

Lack of depth and consistency in the disclosure of wildlife effects commensurate with the impact assessment in the USFWS's Fish

and Wildlife Coordination Report appears to be a major NEPA oversight that needs correcting.

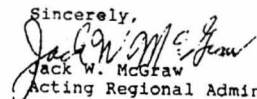
The wetland monitoring and evaluation (M&E) plan becomes even more critical because of the Bureau's plans to underwrite the on-farm wetland losses. Inclusion of at least an acceptable "framework" M&E plan in the final EIS will be acceptable to EPA. It needs to clearly describe the methodology for tracking wetland types, acres, and values lost and gained. If the USFWS Habitat Evaluation Procedures (HEP) are to be used to help monitor changes in wildlife/wetland habitat values, it needs to be clear in the framework plan that an appropriate species model (developed by an inter-agency HEP team) will be used for each wetland type (rather than one model for multiple cover types). The framework plan needs to also contain the schedule for having technical inter-agency concurrence on the detailed M&E plan prior to the development of any on-farm salinity control plans and contracts.

The PR/DEIS states that an "undetermined entity" needs to be found to pay the depletion charge for the Recovery Implementation Program for endangered fish species in the upper Colorado River Basin. This conflicts with the USFWS statement on page 10 of the biological assessment for the Unit (Attachment III) which says "SCS has agreed to require such funding from project recipients." This confusion should be rectified in the final EIS. Reclamation commitments to seek funding to assure that the payment is made should be in the environmental commitments in the final EIS.

The PR/DEIS notes a substantial disagreement between SCS, Reclamation, and USFWS on the economic value of wildlife-oriented recreation to be lost. USFWS has a much higher estimate. Because of the magnitude of wildlife habitat impacts, this is another major issue which needs to be resolved.

In summary, we appreciate the opportunities we have had to discuss our concerns with Reclamation, USDA, and other agencies and we are particularly pleased with Reclamation's efforts to underwrite on-farm wetland losses and the depletion charge. Please continue to use Doug Lofstedt of my staff (303/293-1446 or FTS 330-1446) as your primary EPA contact.

Sincerely,


Jack W. McGraw

Acting Regional Administrator

Attachments - Detailed comments and DEIS rating definitions

cc: Soil Conservation Service, Utah State Office, Salt Lake City
Colorado River Basin Salinity Control Forum and Work Group
U. S. Fish and Wildlife Service, Salt Lake City

Attachment 1

EPA DETAILED COMMENTS ON THE PLANNING REPORT/DRAFT ENVIRONMENTAL
IMPACT STATEMENT (PR/DEIS) FOR THE PRICE-SAN RAFAEL RIVERS
UNIT, COLORADO RIVER SALINITY CONTROL PROGRAM, UTAH

ALTERNATIVES

Page S-5 - The preferred alternative (Resource Protection (RP) alternative) would provide "the greatest salinity reduction to the Colorado River System while meeting cost-effectiveness criteria." Alternatives would be developed to "maximize salinity program benefits" (page I-7). Furthermore, references are made on pages S-9 and IV-3 to the "criterion of cost effectiveness" which apparently requires that "plans which would result in the greatest reduction of salinity ... for the least cost would be recommended for implementation first." However, the Colorado River Basin Salinity Control Act, Amendment (PL 98-569) calls for giving "preference to those additional units or new self-contained portions of units which reduce salinity...at the least cost per unit of salinity reduction". We are not able to find a requirement for plans to have the "greatest reduction of salinity". This appears to be an artificial constraint to development of alternatives under NEPA.

Page I-2 - Out of 585,000 acres of private land in the Unit area, only 45,280 acres are irrigated. Apparently, most of the private land is rangeland which according to page I-3 contributes about 186,000 tons of salt annually (out of the estimated total of 430,000 tons). It is unclear why the action alternatives do not include salinity reduction on rangeland particularly since both the Castle Dale and Ferron watersheds are included in the list of the top eight rangeland watersheds for detailed evaluation in Utah's portion of the Colorado River basin.

Page IV-4 - We are not able to find the statutory requirement that the Soil Conservation Service (SCS) uses as a criterion for salinity plan selection "economic development by increasing the efficiency of agriculture production".

Page IV-7 - The last paragraph states that the RP alternative was formulated to "optimize resource protection". Also, on page S-9, it states that "environmental considerations" were used in selecting the preferred plan. However, we could not find the "environmental considerations" or how the RP alternative optimizes resource protection. The RP alternative increases consumptive water use, stream flow depletions, and loss of wildlife resources (both upland and aquatic, including wetlands), in fact very little wetland replacement has been

targeted for losses of wetland acreage or values from the on-farm program. It does not appear that environmental considerations per NEPA Title I or the policy in the NEPA implementation regulations (40 CFR Part 1500.2), other than salinity reduction, were considered in selecting the action alternatives. Because of wetland/salinity control conflicts, the alternatives should also analyze the need to modify the salinity control legislation to re-visit the wetland replacement issue. Recommendations should be made for appropriate changes in the legislation to address activities that USDA claims it does not have the authority to do to increase wetland replacement.

Page IV-32 - The discussion on why the Improved Irrigation Delivery System was determined to be nonviable should be expanded to cover: 1) what the alternatives were; 2) what the costs were and what level of cost was determined to be unacceptable; 3) whether there are combinations of alternatives, or combinations of portions of alternatives which would be viable; 4) level of salt removal that could be achieved; and 5) who could implement these actions.

Page IV-33 - Retirement of land from irrigation has the "potential for the greatest decrease in salt loading". It is not clear that "social acceptability" is a uniform concern. If the average cost of retirement is \$200 an acre it is likely that there are areas which could be retired for much less than \$100 per acre. What is the current State policy which makes land retirement "not implementable"? How can that policy be modified or accommodated to resolve the conflict? Who can implement such modifications?

Pages IV-42 through 46 - The perspectives of water users and "salinity interests" are used to determine that "the RP plan is viewed as the most acceptable plan based on the analysis of social concerns." However, an analysis to determine the most socially acceptable alternative needs a broader range of interests and perspectives to be credible, including environmental interests.

WETLANDS

Cover page and Page I-1 - The PR/DEIS indicates that it is to be used to satisfy, among other things, the regulatory requirements of Section 404(r) of the Clean Water Act. Our understanding is the cite to 404(r) is an error. The DEIS does not currently meet the procedural requirements of 404(r).

Page III-6 - Replacement of fish and wildlife habitat values foregone would be "at the same cost-share rate as irrigation practices." Documentation needs to be provided (using

comparisons to other on-farm salinity units) that using the same cost-share rates will achieve an acceptable amount of wetland replacement.

Page IV-15 - The EIS should address the opportunities for constructing stockwater ponds in non-saline areas to provide wildlife/wetland habitat. In addition, the ponds should be constructed in upland areas, not existing wetland/riparian areas. Consequently, criteria for pond locations and for wildlife/wetland habitat (including operation and maintenance) should be included.

Page IV-20 - The statement in the third paragraph (and likewise on page V-7) that "Wetland wildlife habitat would be fully mitigated" is misleading. It is not likely that an equal acreage of wetland creation/enhancement off-site will fully replace the wildlife values lost on-site. Other wetland values such as flood desynchronization, recreation, and sediment retention are even more site specific and are not addressed under the current mitigation program. The EIS should recognize the loss of these other wetland values. Secondly, the discussion should also recognize the Bureau of Reclamation's (Reclamation's) recent commitments to underwrite the on-farm wetland replacement program.

Page IV-21 - Table IV-3 presents the wetland impacts resulting from the off-farm construction activities. This table, nor the discussion on page IV-20 of wetland mitigation, seems to directly address the non-construction related impacts described on pages V-9 through V-11 and listed in Table V-3. Please revise the EIS to clearly discuss (and propose mitigation for) all impacts related to construction, implementation, and operation of the off-farm activities.

Page IV-22 - The PR/DEIS discusses the creation and maintenance of wetlands for off-site mitigation "for the life of the project" (page IV-22). The mitigation should be maintained for the duration of the impact rather than "for the life of the project."

Page IV-23 - The discussion of policies regarding wetland replacement needs to include how USDA will respond to Executive Order 11990 (Protection of Wetlands).

The statement is made that replacement of on-farm wetland losses "with irrigation water on the same salty soil would cause the same water quality problem in the Colorado River". However, the EIS needs to: 1) clarify whether there are appropriate design criteria for wetland construction on salty soils to prevent significant salt loading; and 2) document whether wetlands can be developed in areas which would not result in significant salinity impacts and hence,

not defeat the purposes of the salinity control legislation.

Page IV-24 - Similar to the above comment, the first full paragraph implies that all irrigation-induced wetlands result in increased salinity. This conclusion needs to be documented.

The statement is made that "Utah water law does not recognize the use of water by a private landowner for waterfowl/wildlife production as a beneficial Use." There needs to be specific documentation in the EIS that the State Water Engineer will not work with landowners to allow use of water for purposes of wetland habitat creation.

The third full paragraph and the discussion on page IV-58 imply that wetland habitat replacement is increased through the priority rating system. However, the data presented lumps wetland replacement activities with wildlife replacement activities which likely distorts the results as they apply to wetlands. The EIS needs to document how many wetland acres (and type of wetland) have been lost in the Uintah Basin Unit on-farm salinity program and how many acres (by type) have been actually gained (not projected or planned) as a result of voluntary replacement in order to demonstrate effectiveness of the rating system. In addition, recent inter-agency discussions on the Grand Valley Unit indicate that a high proportion of planned wetland replacement (which was based on a priority rating system) may not actually be implemented as planned in the salinity contract. Refer also to the November 4, 1991 memorandum from the U.S. Fish and Wildlife Service, Salt Lake City, to the Bureau of Reclamation Regional Director in Salt Lake City which addresses the contract compliance issue on the Grand Valley Unit. Furthermore, the last sentence on page IV-61 states that landowners will be "asked" to repay cost-shared money when they are found to be in violation of their contract. Does this mean that the landowners are not required to comply with the contract requirements and repay cost-shared money if the contract is violated?

Page IV-27 - The no action alternative indicates that about 200 acres of wetlands will be lost as a result of eliminating irrigation on 3,630 acres when the currently-leased water is converted to cooling water. This results in an average of .06 acres of wetlands being lost for every acre of irrigation eliminated. Tables IV-3 and IV-11 indicate .21 acres of wetlands would be lost for every acre treated under the RP alternative ((7,718-330)/36,050). Tables IV-3 and IV-11 also indicate .16 acres of wetlands would be lost for every acre treated under the NED alternative ((4,452-300)/26,000). Also, based on Tables IV-3 and IV-11, on-farm surface irrigation improvements are projected to result in

.32 acres wetland loss for every acre treated ((7,718-330)-(4,452-330)/10,050).

Why does improving irrigation efficiency under the salinity program eliminate a greater proportion of wetlands per acre treated than removing all irrigation water from a given area? Why is the area being irrigated with the leased water different than the rest of the area?

Why do improved surface irrigation efficiency practices (up to 50-55 percent, page IV-10) result in a greater loss of wetland per acre treated than installation of sprinkler irrigation systems (which would achieve an efficiency of 60-65 percent, page IV-27)? The discussion on page IV-10 seems to indicate that sprinkler irrigation would be used primarily on lands with greater topographic relief. Based on our limited visit to the project area, these "hillier" areas are the types of areas which seem to have more irrigation-induced/enhanced wetlands than the flatter areas and therefore more impacts would be expected. In summary, there seem to be some inconsistent assumptions on wetland impacts which need to be resolved.

Page IV-59 - The first paragraph indicates that USDA will promote replacement of wetland losses with wetlands having open water and a fringe of emergent vegetation although "the section 404 permitting process and restrictions on water rights may severely restrict this activity." Would the restrictions similarly affect the ability of Reclamation to implement its wetlands mitigation commitments? Also, this section should quantify: 1) which waterfowl benefit from pond construction; 2) which waterfowl and other species are adversely affected through the loss of the wire grass/sedge wetlands; and 3) why open water (ponds) and a fringe of emergent vegetation is more valuable than existing wetlands.

The second paragraph estimates that 60 percent of the salinity contracts would contain some wetland/wildlife practices. Please send EPA the data used to come up with this estimate. What percentage of the participation is wetland versus upland habitat replacement? What percentage of the planned wetland replacement has been actually implemented on the ground? How does the acreage of wetlands which have been lost compare with the acreage of wetlands which have been actually replaced? How many acres of wetlands have been lost at the Hancock Cove project? How does it compare to the Uintah Basin Unit project?

The discussion in the third paragraph refers to "objectives for habitat replacement" for the on-farm program. Apparently, USDA has established an objective of only 49 acres of "ponds/wetlands" to replace the loss of 7,388 acres

of wetlands.

Page V-2 - The statement that on-farm wetland impacts would be "replaced to the maximum practical extent" is misleading. The DEIS does not contain the package of initiatives (both USDA and Reclamation) and objectives for a "maximum practical" effort. Likewise, we could not find the objectives for replacement of fish habitat values foregone.

Page V-3 - The DEIS states "Full compliance" with the Fish and Wildlife Coordination Act. However, since the USDA habitat replacement program does not reflect the Fish and Wildlife Coordination Report (FWCR) recommendations (PR/DEIS Attachment III), it is unclear exactly how compliance has been met.

Pages V-17 and 18 - The section on impacts of on-farm measures appear on one hand to recognize the significant changes in wetland habitat values which will result from implementation of the on-farm measures and then attempts to rationalize that these values are not important. Also, monitoring information from the Uintah Basin Unit is used to support a conclusion that "the value changes may not be of a magnitude that would be anticipated by the changes in acreage" (top of page V-18). Then the value of the Uintah Basin monitoring is discredited because of weather patterns and relatively few years of data (footnote 5, page V-18). The assessment of value changes needs to be more conclusive and scientifically supportable.

The EIS needs to properly recognize that resident and migratory species which use the emergent wetland habitat types either solely for a critical life history requisite such as feeding during migration or breeding, will be significantly adversely affected by project implementation. Also, the DEIS needs to clearly state that the on-farm voluntary replacement program proposed is inadequate to replace much, if any, of emergent wetland habitat which could be lost. Based on the information in DEIS Attachment III and Utah Division of Wildlife Resources 1990 Fauna of Southeastern Utah and Life Requisites Regarding their Ecosystems (publication number 90-11), some species which exist in the project area and rely on emergent wetlands either solely or for a major life history requisite include: western terrestrial garter snake, Great Basin spadefoot toad, Great Plains toad, Woodhouse's toad, northern leopard frog, white-faced ibis (a Utah high interest species), northern pintail (a Utah high interest species), american widgeon (a Utah high interest species), green-winged teal (a Utah high interest species), cinnamon teal (a Utah high interest species), blue-winged teal (a Utah high interest species), ferruginous hawk (a Utah high interest species),

northern harrier, ring-necked pheasant (a Utah high interest species), sora, Virginia rail, snowy plover (a Utah high interest species), mountain plover (a Utah high interest species), semipalmated plover, killdeer, lesser golden plover, black bellied plover, black-necked stilt, American avocet, pectoral sandpiper, least sandpiper, common snipe (a Utah high interest species), long-billed dowitcher, marbled godwit, long-billed curlew (a Utah high interest species and a Federal Category 2 candidate species), Wilson's phalarope, short eared owl, marsh wren, red-winged and yellow-headed blackbirds, Brewer's blackbird, montane shrew, montane vole, meadow vole, muskrat, and western jumping mouse. Many of these species are prey species for raptors and other carnivorous animals. The population trend of several of these species is known to be declining. Undoubtedly, there are others.

Why was the long-billed curlew (a Federal Category 2 candidate species) not mentioned in the discussion of species impacted? Populations of this species are known to be declining because of habitat loss. Also, while the FWCR (PR/DEIS Attachment III) points out that populations of the northern harrier (marsh hawk) and the whitefaced ibis (both species of management concern nationally) would be decimated in the project area as a result of project implementation (page 25), no mention is made of impacts to these species. Lack of depth and consistency in the PR/DEIS disclosure of wildlife effects (such as on page V-18) commensurate with the FWCR is a major NEPA oversight to be corrected.

MONITORING AND EVALUATION

Page IV-56 - The second paragraph indicates salinity monitoring of basin outflow would be measured at USGS stations. This seems to contradict the discussion of USGS gauging stations on page I-9 which indicates a broader monitoring network. In order to document actual salinity improvement, upstream monitoring will also be needed in order to achieve valid comparisons. Upstream and downstream pre-project water quality sampling needs to be established prior to project initiation. Is this sampling data already being collected by USGS, Utah Department of Environmental Quality, and consultants?

The third full paragraph states that the monitoring and evaluation (M&E) plan for the Unit "would be developed". There are also some general discussions of M&E plans for wildlife habitat. The fourth paragraph indicates the U. S. Fish and Wildlife Service (USFWS) Habitat Evaluation Procedures (HEP) would be used in monitoring. There needs to be at least an acceptable "framework" M&E plan in the EIS (this becomes even more critical because of the Bureau's

plans to underwrite the on-farm wetland losses). It needs to clearly describe the methodology for tracking wetland types, acres, and values lost and gained. It needs to be clear that an appropriate HEP species model (developed by an inter-agency HEP team) will be used for each wetland type (rather than one model for multiple cover types). The framework plan needs to also contain the schedule for having technical inter-agency concurrence on the detailed M&E plan prior to the development of any on-farm salinity control plans and contracts.

OTHER COMMENTS

Page S-2 - A misleading reference is made at the top of the page that Colorado River salinity standards have been adopted by the basin states and approved by EPA "to meet the numeric criteria" that have been established. It should be clear that the Colorado River basin salinity standards include the numeric criteria and a plan of implementation. The fourth full paragraph in page II-2 also indicates that the standards are just the numeric criteria.

Page S-3 - Of the 66,450 acres of land with appropriated water rights, only about two-thirds is presently irrigated. It is not clear throughout the document whether the land not currently irrigated will become irrigated, whether USDA will assist this new irrigation, and the resulting salt contributions.

Page S-5 - The second paragraph indicates that increased irrigation efficiencies will result in increased end of year irrigation of existing lands. Will the late season irrigation only occur on lands with salinity control practices installed? Will enough water be saved to allow 30 percent of the land with water rights but no water to have water in the future? What are the environmental impacts of such increased irrigation? Furthermore, at the bottom of page I-6 the statement is made that reuse of water made available by the salinity program "would result in minor reduction in salinity benefits and has been considered in the hydro-salinity analysis." Please point out in the hydro-salinity analysis (Attachment IX) where the minor reduction in salinity benefits is factored in. How the SCS/Reclamation will ensure that future use of any saved water will not result in increased salt loadings needs to be clearly explained (item 3 in fourth paragraph, page III-2).

Page S-7 - Please define what the Upper and Lower Basin Funds are.

Pages S-9 and IV-3 - The DEIS presents some confusing language regarding Public Law 92-500, the Federal Water Pollution

Control Act (FWPCA). On page S-9, it states that P.L. 92-500 "sets forth a public policy of nondegradation of water quality not governed by traditional economic evaluation, but rather by the accomplishment of the objective at least cost to the Federal Government per ton of salt removed." On page IV-3, it states that the law "sets forth a public policy of nondegradation of water quality, using a criterion of least cost to the Federal Government (cost per ton of salt removed)." The language needs to be revised to: 1) clarify the objective of the FWPCA "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Sec. 101(a)); 2) clarify that 40 CFR Part 131 presents the federal regulations which the states must follow in implementing antidegradation requirements; and 3) remove language about "traditional economic evaluation" and "least cost to the Federal Government per ton of salt removed" (these references are to the salinity control legislation).

Page I-2 - We question the wording of the last paragraph. Rather than the objective of the salinity program "to improve downstream water quality", it is to meet the water quality standards for salinity (numeric criteria and plan of implementation) adopted by all the basin states. Clarification of the salinity standards also should be made in the fourth full paragraph on page II-2. Furthermore, a reference is made to the salinity program "assisting the Lower Basin States to meet salinity standards". The salinity standards were established and adopted by all the basin states and are met under a basinwide approach, not just by the Lower Basin.

Page I-9 - An inaccurate reference is made in the footnote that the Colorado River Basin Salinity Control Forum was established "under" the FWPCA.

Page II-3 - Table II-2 should be titled "Flow-weighted annual average salinity at Imperial Dam". The discussion of meeting the numeric criteria (first full paragraph) should also discuss anticipated frequency of compliance under the 1990 Plan of Implementation.

Page II-9 - The discussion of salt loading should identify the relative contributions of salinity by irrigated area or subunit to provide a basis for prioritizing salinity control efforts.

Page III-1 - Chapter III does not seem to address the stated goal of discussing "those present and anticipated opportunities and resources that would be necessary ingredients to the formulation of viable alternative plans for reducing the salt contribution to the Colorado River Basin."

Page III-2 - Item two under Utah water law impacts states any water savings "must remain available for beneficial use". The EIS should clarify whether use of water made available from salinity control can be protected by the State for in-stream flows.

Page III-6 - The PR/DEIS states near the top of the page that "A purpose of this document is to present the environmental effects...and, at the same time, attempting to minimize adverse impacts." We could not find a discussion of how impacts would be minimized. Please expand the EIS to address impact minimization techniques.

Page IV-24 - The fourth full paragraph indicates an undetermined entity needs to be found to pay the depletion charge (\$10.91 per acre-foot) for the Recovery Implementation Program for endangered fish species in the upper Colorado River Basin. This conflicts with the USFWS statement on page 10 of the biological assessment for the Unit (Attachment III) which says "SCS has agreed to require such funding from project recipients." If that is the case it seems the "undetermined entity" will be the landowners who will have salinity contracts. Apparently this confusion will be rectified in the final EIS by Reclamation commitments to seek funding to assure that the payment is made.

Furthermore, Tables IV-8 and V-1 appear to mislead the reader with regard to threatened and endangered (T&E) species. What does the term "compliance" for T&E species mean? Presuming that the term "compliance" means the project will comply with the T&E requirements seems to conflict with the statement on page IV-24 which indicates that the depletion payments will be made by an undetermined entity. If the entity cannot be determined how can the PR/DEIS indicate that compliance has been accomplished?

Page IV-27 - The information presented for salinity reduction efficiencies under the no action alternative seems to conflict with that presented for the NED and RP alternatives. Currently, Utah Power and Light (UP&L) leases to irrigation 13,400 acre feet (AF) of water. If this water is removed from irrigation, it is projected the depletion would be about 7,140 AF. Is this depletion the total depletion to the river resulting from cooling water consumptive use, or the depletion to deep percolation? Assuming the best case that the 7,140 AF is depletion of deep percolation, the abandonment of irrigation results in a salt loading reduction of 1.97 tons/AF based on the projected salt load reduction of 14,080 tons. Is the cooling water consumptive use total or is some water with high total dissolved solids released to the river? Table

IV-11 (page IV-47) indicates the loss to deep percolation as a result of the conversion to cooling water of the 13,400 AF is 3440 AF or 4.09 tons/AF. This table also indicates 6260 AF would be removed from irrigation as a result of power production while a total of 13,400 AF is removed from the Colorado River. An explanation is needed to clarify these projected reductions. Also, it appears that Table IV-11 should indicate the salt removed annually under the No Action alternative. Also, page IV-28 discusses future on-farm irrigation improvements projected under the no action alternative. It is not clear if these activities are expected to result in quantifiable salinity reductions although it appears likely since some irrigation improvement would occur and some lands are projected to be removed from fully irrigated status. Are these salinity reductions included in Table IV-11?

Given the above questions, it appears the salinity savings presented in Table IV-11 are inconsistent with those in other areas of the PR/DEIS. (EPA has examined Attachment IX. It would be useful if the terminology in Attachment IX was further explained to ease the comparison of the values in Attachment IX and those in Table IV-11.) For example, under the RP alternative, a reduction in deep percolation of 32,110 AF results in a salinity reduction of 161,000 tons or 5.01 tons/AF. This seems to be a 25 percent increase in salinity reduction efficiency over that listed for the No Action condition. Please explain if our understanding of the data presented in Table IV-11 is incorrect. Otherwise, please provide the rationale of why some types of deep percolation reduction (i.e. land retirement) is less efficient at reducing salt load than other types (i.e. improvement in irrigation efficiencies).

These calculations are more confusing if the deep percolation values presented on page V-22 are considered. The RP alternative results in a deep percolation return flow of 39,810 AF. The NED alternative results in a deep percolation return flow of 42,900 AF. These values are very different than those presented in Table IV-11.

Page IV-39 - Table IV-8 states "Compliance with Endangered Species Act and Colorado River Endangered Fish Recovery Plan" as the project's impact on endangered species. However, just stating that the project is in compliance does not describe the impact.

Page V-3 - The PR/DEIS states that there is "Full compliance" with the Clean Water Act. However, it is not clear from the document how the project meets the objective of the Act, i.e., "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Sec. 101(a)).

Page V-21 - The water quality analysis needs to be expanded to include non-salinity parameters. This is especially important since changes in domestic and stock watering sources are proposed. We suggest the Utah Department of Environmental Quality be consulted for current water quality data.

Page V-24 - It is not clear how a reduction of stream flow by 22,460 AF annually by the on-farm program can be termed "not significant". Also, the changes in flows need to be identified in more detail similar to the discussion of flow impacts by the off-farm program on the same page.

Page V-25 - There should be a more in-depth analysis of affects on fisheries (not just trout) by stream to support the assertion of no expected impact. For example, the project would reduce flows in Ferron Creek by "50 percent of the remaining water" (page V-44). What is the impact to fisheries and other aquatic life and integrity under the CWA? The impact disclosure should be at least commensurate with the depth of analysis in the FWCR.

The impact on roundtail chub is not expected to be significant. However, on page V-44 the impact of water removals on the roundtail chub is termed "unknown". The FWCR predicts "serious adverse impacts to the species" (page 16). Also, we could not find where the environmental commitments in the PR/DEIS incorporate USFWS recommendations for the roundtail chub (FWCR page 28).

Page V-36 - The PR/DEIS states that Reclamation and SCS have a substantial disagreement with USFWS predictions of the economic impact of the project on wildlife-oriented recreation (second full paragraph). We could not find the rationale for the disagreement nor any project cost related to lost wildlife-oriented recreation (no matter what estimate is used) in the economic analysis portion of the DEIS. Because of the magnitude of wildlife habitat impacts, this is a major issue which needs to be resolved.

Page V-40 - The section on cumulative impacts contains very little substantive information on cumulative impacts of the project per the definition in the NEPA regulations (40 CFR 1508.7). For example, more information should be included for cumulative impacts on fisheries, water quality, aquatic habitat and stream integrity, and vegetation.

ENVIRONMENTAL IMPACT OF THE ACTION

LO--Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns

The EPA Review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. (The) EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). (The) EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare, or environmental quality. (The) EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate

(The) EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information

The draft EIS does not contain sufficient information for (the) EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new, reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate

(The) EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, and which should be analyzed in order to reduce the potentially significant environment impacts. (The) EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. (The) EPA does not believe that the draft EIS is adequate for the purposes of NEPA and/or Section 109 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
UTAH STATE OFFICE
2078 ADMINISTRATION BUILDING
1745 WEST 1700 SOUTH
SALT LAKE CITY, UTAH 84104-5110



In Reply Refer To

(FWE)

March 20, 1992

MEMORANDUM

TO: Bureau of Reclamation, Provo, Utah

FROM: Assistant Field Supervisor, Fish and Wildlife Enhancement, U.S. Fish and Wildlife Service, Salt Lake City, Utah

SUBJECT: Review of Price-San Rafael Planning Report/Draft Environmental Impact Statement (PR/DEIS), Colorado River Salinity Control Program

ATTN: UPO-712

The Fish and Wildlife Service (Service) has evaluated the above-referenced PR/DEIS to determine if adequate mitigation measures are proposed to offset project impacts on fishery and wildlife resources.

The Service, in conjunction with the Utah Division of Wildlife Resources (UDWR), has prepared a Coordination Act Report (CAR) recommending measures to be taken to mitigate the project's impacts to wildlife. The PR/DEIS discusses the recommendations in this report in Chapter VI, pp. VI-7 and 8. We appreciate Reclamation's commitments to mitigate for wetlands disturbed by off-farm construction activities and to seed disturbed upland habitats, however, the project proponents have rejected three of the CAR mitigation recommendations. Specific Service concerns with failure to implement the other recommended mitigation measures follow.

Throughout the PR/DEIS it is noted that up to 7,718 acres of wetlands lost due to the Soil Conservation Service's on-farm construction and irrigation technology changes will not be mitigated, except voluntarily at the discretion of individual land owners. It is pointed out that the mitigation of these wetlands on-site and in-kind would be detrimental to the purpose of the project, that is the reduction of salinity in the Colorado River (p. I-4). Our report recognized that problem and therefore recommended that mitigation measures for on-farm wetland losses be made off-site and out-of-kind. The Service and UDWR determined that the most effective and beneficial off-site mitigation measures would be the fee purchase of 12,384 acres of floodplain and riparian corridors in the two drainage basins. The failure to commit to any part of this mitigation plan or to the replacement of lost wildlife habitat on site leads the Service to determine that the project will lead to the unmitigated loss of up to 7,718 acres of important wildlife habitats.

The other concerns of the Service have to do with the reduction in flows of the two rivers, and the consequent effects on wildlife and wildlife habitats. The PR/DEIS states that up to a 50% reduction in flow volume will occur in the rivers.

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United States Department of the Interior
FISH AND WILDLIFE SERVICE

UTAH STATE OFFICE
2060 ADMINISTRATION BUILDING
1745 WEST 1700 SOUTH
SALT LAKE CITY, UTAH 84104-5110



In Reply Refer To

March 22, 1993

Robert F. Sennett
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 11350
Salt Lake City, Utah 84147

Dear Mr. Sennett:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter discussing impacts of the proposed Price-San Rafael Rivers Unit of the Colorado River Salinity Control Program on roundtail chubs, a candidate species for listing as threatened or endangered.

The Service concurs with your assessment that the Draft Environmental Impact Statement (DEIS) prepared in August of 1991 is based upon the best information available on roundtail chubs and that the project would not negatively affect this species.

We do have concerns, however, with the documentation in the DEIS on threatened and endangered species effects. The species list used to determine if there would be any adverse effects on threatened or endangered species was prepared in 1987 and is out of date. The Biological Assessment was prepared on that list in 1988. While attempts have been made to update species status in the text of the DEIS the overall narrative is inadequate. For example, the discussion of roundtail chub on p. V-23 classifies the chub as State sensitive but does not indicate that the species is also on the Service's candidate species list. Another candidate species which occurs in the area, the flannelmouth sucker, is not addressed at all. It should also be noted that there was a successful bald eagle nest in the Castle Dale area in 1992. Any proposed activities in the area of the nest will need to be evaluated to determine if there would be adverse effects.

The Service requests that the Soil Conservation Service prepare an updated Biological Assessment based on the following list of threatened, endangered and candidate species.

Listed

Peregrine falcon	E	<u>Falco peregrinus</u>
Bald eagle	E	<u>Haliaeetus leucocephalus</u>
Humpback chub	E	<u>Gila cypha</u>
Bonytail chub	E	<u>Gila elegans</u>
Colorado squawfish	E	<u>Ptychocheilus lucius</u>

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Razorback sucker	E	<u>Xyrauchen texanus</u>
Black-footed ferret	E	<u>Mustela nigripes</u>
Jones cycladenia	T	<u>Cycladenia humilis v. jonesii</u>
Maguire daisy	E	<u>Erigeron maguirei v. maguirei</u>
San Rafael cactus	E	<u>Pediocactus despainii</u>
Heliotrope milkvetch	T	<u>Astragalus montii</u>

Candidate

Northern goshawk	<u>Accipiter gentilis</u>
Ferruginous hawk	<u>Buteo regalis</u>
Black tern	<u>Chlidonias niger</u>
Western least bittern	<u>Ixobrychus exilis hesperis</u>
Loggerhead shrike	<u>Lanius ludovicianus</u>
White-faced ibis	<u>Plegadis chihi</u>
Roundtail chub	<u>Gila robusta</u>
Flannelmouth sucker	<u>Catostomus latipinnis</u>
Heliotrope pika	<u>Ochotona princeps moorei</u>
Creutzfeldt catseye	<u>Cryptantha creutzfeldtii</u>
Smith wild buckwheat	<u>Eriogonum smithii</u>
Canyon sweetvetch	<u>Hedysarum occidentale v. canone</u>
Low hymenoxys	<u>Hymenoxys depressa</u>
Jones psorothamnus	<u>Psorothamnus polyadenius v. jonesii</u>
Thompson's pink flame-flower	<u>Talinum thompsonii</u>

We wish to advise you that critical habitat for the endangered razorback sucker, Colorado squawfish, humpback chub, and bonytail chub was proposed in Federal Register Vol. 58, No. 18, dated January 29, 1993.

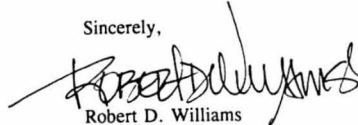
Section 7 of the Endangered Species Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened, and with respect to any critical habitat that is designated or proposed for the species. Section 7(a)(4) of the Act and 50 CFR 402.10 require Federal agencies to confer informally with the Service on any action that is likely to result in the destruction or adverse modification of proposed critical habitat. If critical habitat is subsequently designated, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to destroy or adversely modify critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible agency must enter into consultation with the Service. At that time you should provide this office a copy of the biological assessment and any other relevant information that assisted you in reaching your conclusion.

The Service can enter into formal Section 7 consultation only with another Federal agency. State, county, or any other governmental or private organizations can participate in the consultation process, help prepare information such as the biological assessment, participate in meetings, etc.

Your attention is also directed to Section 7(d) of the Endangered Species Act, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species

If you have any questions please contact us at (801) 975-3630. The Service representative who will provide you technical assistance is Susan Linner.

Sincerely,



Robert D. Williams
State Supervisor

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Stabilization and Conservation Service
Emery-Carbon County Office
88 South 1st East - Box 758
Castle Dale, Utah 84513 0758
November 12, 1991

To Bureau of Reclamation and Soil Conservation:

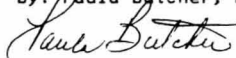
The Carbon County ASC Committee feels the Salinity Program as proposed by the Bureau of Reclamation and Soil Conservation Service will benefit the farmer and urban population of Carbon County.

Our understanding of the Salinity Program is based on the draft E.I.S., visits to the Uintah Basin to view projects and observe their planning, and talking with farmers in the basin area who have installed practices under the Salinity Program. We have also attended meetings held in Carbon and Emery Counties sponsored by the Bureau and SCS.

We feel the program will provide adequate funding for farmers so they can install a complete irrigation system on their farms which will save water, reduce swamping of cropland and should enhance the environment.

Respectfully,

Carbon County ASC Committee
by: Paula Butcher, Member



UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Stabilization and Conservation Service
Emery-Carbon County Office
88 South 1st East - Box 758
Castle Dale, Utah 84513 0758
January 17, 1992

SEARCHED	INDEXED
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FBI - CARBON COUNTY	

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Regional Director
Bureau of Reclamation
145 South State Street
P. O. Box 11568
Salt Lake City, Utah 84147

To: Bureau of Reclamation and Soil Conservation Service

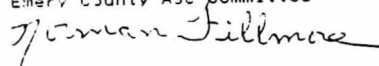
The Emery County ASC Committee feels the Salinity Program as proposed by the Bureau of Reclamation and Soil Conservation Service will be of benefit to the farmer and urban population of Emery County. Our understanding of the Salinity Program is based on the draft E. I. S., and attending public meetings regarding the E. I. S.

Individual farmers coming into the county office have expressed support for the program and are asking 'when can we start?'

The Emery County ASC Committee supports the Salinity Program. We feel a voluntary approach with cost-share incentives to wetland mitigation is the proper way to proceed.

Respectfully,

Norman Fillmore, Chairman
Emery County ASC Committee





3/7/92

ORIGINAL

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Moab District
Price River Resource Area
900 North 700 East
Price, Utah 84501

IN REPLY REFER TO

Bureau of Reclamation
P. O. Box 51338
Provo, Utah 84605

Attention: UPO-712

Dear Sirs:

The following comments are provided on the Planning Report/Draft Environmental Impact Statement, Price-San Rafael Rivers Unit, Colorado River Water Quality Improvement Program, Colorado River Salinity-Control Program. Our general concerns evolve around reduced flows resulting from project implementation and the associated impacts to public lands. Of particular interest are the predicted or estimated impacts to wetland and riparian habitats. We have two specific areas of concern we will address, Olson Reservoir and wetland area, and the Price and San Rafael rivers.

One final concern is the potential impact to the roundtail chub, a candidate species, found in the Price and San Rafael rivers.

Olson Reservoir and Wetland Area

On page V-14 under Waterfowl, casual reference is made to Olson slough as providing limited waterfowl use and hunting. We believe this is a gross underestimate of the values Olson Reservoir and its associated cattail marsh provide for waterfowl and shorebirds. Olson Reservoir is one of the single most important waterfowl areas on public land in southeast Utah.

The Bureau of Land Management has recognized the values Olson Reservoir provides to waterfowl and has conducted monitoring studies for several years to document these values. These studies reveal that Olson Reservoir provides habitat (annually) for several pairs of nesting geese, dozens of pairs of nesting ducks, a black-crowned night heron rookery, and supports on a daily basis, several hundred waterfowl during spring and fall migration. We believe that Olson Reservoir shares a commensurate relationship with Desert Lake waterfowl management area to support a larger population of nesting and migrating waterfowl in this area.

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Reply Date	Initials	Code
		186
	JM	305
1/25	SWK	780
		712
		150
		406
		430
Action 712		
Classification		
Project		
Control No.		
Funding A/L		
Keyword		

JAN 24 1992

Concerns for Olson Reservoir are threefold:

1. Project implementation will reduce inflows to Olson by 1.350 cfs, or approximately 20 percent annually.
2. Loss of an undetermined amount of wetland-riparian habitat due to reduced inflows, causing a conversion of wetland to upland habitats.
3. Loss of available water necessary to continue to sustain water requirements for livestock and big game.

We feel the potential impacts identified for Olson are significant and should be fully mitigated. We recommend the BOR work with BLM to develop a mitigation project that will maintain or enhance through habitat and project management, the wildlife values presently recognized from the Olson Reservoir/wetland habitat area. We have included as Enclosure 1, an option paper which discusses possible alternatives for mitigation at Olson. We request technical assistance from the BOR to complete a feasibility study on alternatives proposed in this paper as a first step toward developing a viable, effective mitigation project.

With respect to impacts to the wetland habitat present at Olson, we believe that any loss will be significant.

BLM policies, backed by Executive Orders 11990 and 11988, specifically direct us to avoid impacts to wetland-riparian habitats wherever possible. We also recognize the difficulty in quantifying the exact amount of habitat which will be affected by the reduced inflows.

We make two recommendations to address our concerns:

1. BOR initiate a monitoring study on the Olson Reservoir/wetland area using large scale, color infrared photography to quantify and map wetland habitat types present before project implementation. This baseline data can be repeated after project completion to estimate actual project effects.
2. BOR commit to mitigation of impacts for losses of wetland habitats as identified by the monitoring study.

Price and San Rafael Rivers:

Average annual flows into the Price and San Rafael rivers are expected to be reduced by 2.0 percent and 1.7 percent, respectively. According to data presented in Appendix 3, Table II, reduced flows will be as high as 49.2 percent (Price River) in July. Again, actual effects of the predicted reduced flows to riparian habitat are difficult to quantify. We again make two recommendations to address potential impacts to riparian habitats on these rivers.

1. Initiate a long-term monitoring study using large scale, color infrared photography. Map and quantify riparian habitat types present to be compared with similar data collected after project completion.

2. Require complete mitigation for loss of riparian habitat resulting from project, as documented by the monitoring study.

Potential effects to the roundtail chub have not been adequately addressed in the draft EIS. BLM is directed through policy to manage all candidate species in such a manner so as to avoid the need for official listing.

Predicted changes in flows within streams known to support this species are significant. These issues are clearly brought out in the U. S. Fish and Wildlife Coordination Act Report. We concur with the recommendations set forth in the report and would like to see them included as part of the mitigation package for this project.

Sincerely yours,

Sean Niffeler
Acting Area Manager

Enclosure:
Enclosure 1

NOTICE: IF YOU DETACH
ENCLOSURES, PLEASE INSERT
CODE NO. _____

OLSEN RESERVOIR/MITIGATION OPTION PAPER

The intent of this option paper is to identify possible project alternatives that would serve as suitable mitigation for impacts of reduced flows, loss of wetland habitat, and reduced availability of water for big game and livestock resulting from implementation of the salinity control project.

Project Goal: The common goal for all of the alternatives discussed below is to retain and or enhance the values that Olsen Reservoir/wetland area provide to wildlife species using the area.

Objectives: The following objectives are also common to all alternatives discussed.

1. Maintain or increase existing surface acres of open water habitat available to waterfowl for resting or stopover during spring and fall migration October 15- April 15.
2. Maintain a minimum of 1/3 of existing surface acres of open water habitat available to waterfowl during the nesting season, April 15- August 15.

Alternative 1:

1. BOR purchase all water rights presently used for irrigation and allow the reservoir to be managed for waterfowl production.
2. BLM join into an agreement with UDWR or USFWS, who would hold water rights for waterfowl habitat, and intensively manage the area for waterfowl and shorebirds.

Alternative 2:

1. Reconstruct the dam and reservoir basin to increase storage capacity and prevent dewatering of the minimum 1/3 surface acres identified in objective 2.
2. BOR purchase sufficient water rights resulting from the increased storage capacity to maintain the minimum 1/3 surface acres identified in objective 2.
3. BLM join into an agreement with UDWR or USFWS, who would hold water rights for waterfowl habitat, and intensively manage the area for waterfowl and shorebirds.

COOPERATIVE EXTENSION SERVICE



UTAH STATE UNIVERSITY

CARBON COUNTY EXTENSION

Courthouse
Price, Utah 84501
(801) 637-4700

Bureau of Reclamation Upper Colorado River System
US Dept. of Agriculture
Soil Conservation Service
Price-San Rafael River Salinity Program

Public Hearing Statement for Price-San Rafael River Salinity
From Jack Soper, Carbon County Agent Cooperative Extension Service.

The salinity program in Carbon and Emery Counties can have only positive results on water quality, agriculture production, wildlife habitat and improvement of the economy of the two counties.

With the reduction of 161,000 tons of salt from the Colorado River system, water quality will improve within the two counties and in the lower Colorado River crops will improve through more efficient irrigation system and better crop management. Through better water management more acres of farm ground that had insufficient irrigation water will be able to be irrigated with the water saved through better irrigation efficiency. Wildlife habitat areas will be developed to help in maintaining the population of game animals, birds, and other wildlife. With an estimated cost of over \$77,000,000 the economic ripple effect will benefit the agriculture businesses, construction companies and the labor force of Carbon and Emery Counties.

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Charles E. Johnson, CPA
Office Director
Brad T. Barber
Office Deputy Director
Rod D. Millar
Committee Chairman
John A. Harja
Executive Director

OFFICE OF PLANNING AND BUDGET
Resource Development Coordinating Committee

116 State Capitol
Salt Lake City, Utah 84114
(801) 538-1027

December 20, 1991

Marilyn O'Dell
Soil Conservation Service
P.O. Box 11350
Salt Lake City, UT 84147-0350

SUBJECT: Upper Colorado Price-San Rafael Salinity Control Planning Report/Draft EIS
State Identifier Number: UT910926-010

Dear Ms. O'Dell:

The Resource Development Coordinating Committee, representing the State of Utah, has reviewed this report. The Division of Wildlife Resources comments:

The Division of Wildlife Resources has been actively involved in this project for over a decade.

By authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Division of Wildlife Resources has jointly developed a Coordination Report with the U.S. Fish and Wildlife Service (USFWS). One purpose of this Act is to provide direction for any federal agency planning to modify a stream or other body of water for any purpose. This direction details the necessary steps in determining what damage to wildlife may be attributed to the project by consulting with the USFWS and the state wildlife agency. The Division's evaluation of project impacts and recommended mitigation measures may be found in this report. A draft of this report is included in the DEIS, Attachment III.

Section 662, subsection (b) of the Act describes the obligation of the reporting officers to "give full consideration to the report and recommendations of the Secretary of the Interior and to any report of the state agency on the wildlife aspects of such projects, and the project plan shall include such justifiable means and measures for wildlife purposes as the reporting agency finds should be adopted to obtain maximum overall project benefits." At this time, we do not believe the DEIS adequately addresses or mitigates for the potential impacts to the state's wildlife resources, as described in the Coordination report.

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Marilyn O'Dell
December 20, 1991
Page 2

After reviewing the DEIS, our greatest concern is with the proposed on-farm mitigation plan. Projected wetland losses for full project implementation are 7,718 acres. The loss of these wetland habitats will result in loss of waterfowl nesting, brooding and resting habitats; loss of habitats for upland game and mule deer; loss of habitat for long-billed curlew, a Category 2 candidate species; loss of nesting and feeding habitat for northern harrier and white-faced ibis; feeding habitat for loggerhead shrike and all migratory nongame birds of management concern in the United States; loss of habitat supporting prey base for raptors including northern harrier, rough-legged hawk and American kestrel; and a loss of over \$3,959,843 per year (1985 dollars) spent by hunters hunting in the project area of Carbon and Emery counties (refer to page 24, Table XIV in the Coordination Report). The document suggests a voluntary program for on-farm mitigation but does not provide details. At the minimum, the document must provide a clear description of the program, expected benefits, and resulting wildlife habitat values replaced. Without clarification of this program, the Division must consider these listed impacts as unmitigated impacts.

Our concern continues to be with the reduction of water available for Desert Lake Waterfowl Management Area (Desert Lake) and at Olsen Reservoir. Although the document suggests the post-project volumes should be sufficient to meet our needs at Desert Lake, we recommend long-term monitoring of these flows be conducted and initiated before project construction. This should be included as part of the Monitoring and Evaluation section (IV-56). If impacts occur to Desert Lake, mitigation will be expected. Desert Lake was acquired and developed for the Division to manage as a wetland area mitigating wetland losses caused by construction of Joe's Valley Reservoir. Impacts to Desert Lake are unacceptable. Mitigation associated with Desert Lake may include more water available in June for waterfowl production, and acquiring additional land for developing more waterfowl areas and upland habitat. Reduction of water available to Olsen Reservoir will result in impacts to waterfowl, wetlands and eventually hunting opportunities. Potential mitigation includes the Bureau of Reclamation conducting a feasibility study to increase water storage, increasing water storage in the reservoir, and providing a minimum pool level by acquiring water rights, which would serve as mitigation for lost waterfowl production, wetlands, and hunting opportunities.

The loss of 25,310 acre-feet of water to the Colorado River is of concern to us. This document only provided a cursory review of the potential impacts to the roundtail chub, which is now listed as a Category 2 candidate species under the

Marilyn O'Dell
December 20, 1991
Page 3

Endangered Species Act. Category 2 designation means listing is possibly appropriate for the candidate species, but conclusive data is not currently available. The Division and U.S. Fish and Wildlife Service proposed a project area status and distribution study be conducted on this species (Attachment III, Coordination report, Appendix B page 29). With the recent change in status, we believe the DEIS would be incomplete without a more thorough evaluation of the species distribution and status, as well as long-term monitoring to determine habitat needs and limitations within the project area. Considering the status of this species, the Division believes this proposal should be included in the Monitoring and Evaluation section (IV-56) of this document and not taken from the required contribution to the Colorado River Fishes Recovery Plan as proposed on page VI-8.

Clarifications, Corrections, and Specific Points of Disagreement

- S-4 Scofield Reservoir is managed for rainbow and cutthroat trout, not brook trout.
- IV-20 Golden eagle nests require buffer zones of 1/2 mile, not 1/4 mile as stated.
- IV-24 Change Utah Division of Natural Resources to Utah Department of Natural Resources
- V-6 A pronghorn herd currently exists in the Castle Valley area, and is part of the Iclander Wash herd.
- V-18 The Division does not believe the findings for the Uintah Basin and what will be seen in the Price-San Rafael Basin will be similar. Statements made on this page referring to few impacts to mule deer, raptors, and other species do not agree with our conclusions in the Coordination Report.
- V-23 Define Price Canyon. The statement "sport fish are nonexistent from Price Canyon to Farnham Dam" is incorrect. Sport fish occur in the Price River down to the first diversion at the golf course. Upper parts of Grassy Trail (rainbow and brown trout), Gordon and Willow creeks (cutthroat trout) contain game fish. Roundtail chub are classified as a Category 2 candidate species.

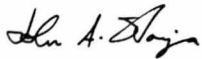
V-36 The statement, "Although hunting on private lands might be affected during the construction phase, because the area would remain in agriculture-associated habitat, there would not be a significant long-term impact on upland game and big game species," does not agree with Division of Wildlife Resources and USFWS conclusions (Coordination Report). Upland species such as pheasants will be impacted dramatically. We do not agree with the conclusions for Desert Lake or Olsen Reservoir.

In summary, the Division supports the findings, conclusions, and recommendations provided in the Fish and Wildlife Coordination Act report. We do not concur with this document's statements that refer to on-farm wetlands habitat as limited-value wildlife habitat. This appears to be the basic argument used in this document to avoid mitigating on-farm impacts (V-17, VI-7). Much of the lost wildlife habitat that will occur on-farm does not fit the description this document continues to use. Quite often, the habitat is available for a variety of species depending on the time of year and farm management practices. The USFWS and the Division place higher values on this habitat and submit our recommendations in the Coordination report.

We are concerned with the Colorado River's water quality and support efforts to improve the salinity problems. It should be apparent that the DEIS does not address our concerns or adequately mitigate for lost wildlife habitat. The Coordination report has been prepared by the two agencies given responsibility for fish and wildlife management and protection in Utah. The evaluations, conclusions, and recommendations within this report need to be considered further.

The Committee appreciates the opportunity to review this proposal. Please direct any other written questions regarding this correspondence to the Utah State Clearinghouse at the above address, or call Carolyn Wright at (801) 538-1535 or John Harja at (801) 538-1559.

Sincerely,


for Brad T. Barber
State Planning Coordinator

BTB/rpj



OFFICE OF PLANNING AND BUDGET
Resource Development Coordinating Committee

Charles E. Johnson, CPA
Office Director
Brad T. Barber
Office Deputy Director
Rod D. Millar
Committee Chairman
John A. Harja
Executive Director

116 State Capitol
Salt Lake City, Utah 84114
(801) 538-1027

January 27, 1992

Marilyn O'Dell
Soil Conservation Service
P.O. Box 11350
Salt lake City, UT 84147-0350

SUBJECT: Upper Colorado Price-San Rafael Salinity Control Planning Report
State Identifier Number: UT910926-010

Dear Ms. O'Dell:

The Resource Development Coordinating Committee, representing the State of Utah, has reviewed this proposal. The Division of Water Resources comments:

The Division of Water Resources has previously submitted written comments and testified at the public hearings. The following comments are in addition to those already presented.

Currently, the Division of Water Resources strongly supports the salinity control program in the Colorado River Basin with current programs in the Uinta Basin of Utah and in other Colorado River Basin States. Addition of the Price-San Rafael Rivers Unit to the salinity control program is highly recommended, as it is a cost effective method that will result in substantial salinity reduction.

The program currently has voluntary participation from many private landowners in the Uinta Basin. Replacement of associated wildlife benefits should also remain on a voluntary basis by participants in the program. Mandatory replacement of all irrigation induced wetlands, on a one to one basis in the area, will defeat the whole purpose of the project. Mandatory inclusion of wetlands and wildlife mitigation measures, as recently suggested by EPA, as a requirement for participation in the program, will engender resentment of participants towards the program. The Division encourages the USBR and the SCS to look at alternative areas for mitigation besides the Cottonwood Creek area.

It appears that there is a local concern with the use of Emery County USBR Project water versus non-project water in the Cottonwood area of the project. The USBR and the SCS should continue to work with local water users in further refining the projects to meet the needs of the participating landowners, as well as to meet the goals of the salinity reduction program. If local support does not exist in some areas for the project, the Division would encourage the USBR and the SCS to reformulate the project to exclude these areas.

Responsibility for payment of depletion charges by the project under the Colorado River Basin Salinity Control Program should be defined in the authorizing legislation for the Price-San Rafael Rivers Unit.

The Division of Water Rights comments:

There are two major water right issues which are of concern to us.

1) If the project is implemented as recommended, it will increase the depletion to the Colorado River by about 25,000 acre-feet per year.

2) The water right issue related to the replacement of wetland and wildlife habitat.

It appears that improvements proposed to the irrigation conveyance systems and the conversion from flood irrigation to sprinkler irrigation will result in increased depletion. The State Engineer is supportive of users improving their water use efficiency, yet he must ensure that all water rights are protected at the same time. On many river systems in Utah, the water users on the lower reaches have historically relied upon irrigation return flows to supply part or all of their water rights. As an irrigator converts to more efficient irrigation methods, a number of legal and institutional issues are raised. The report appears to document this issue fairly well. The section on pages II-9 through II-11, entitled "Existing Irrigation Systems and Practices," appears to accurately describe the historical practices. In table V-5, page V-13, it indicates that 12,310 acres presently receive only a partial water supply. Under the Resource Protection Plan, these lands would receive a full water supply as a result of improved irrigation efficiency.

It appears that these partially supplied lands have received the majority of their water supply during the runoff period and have suffered shortages during the late summer. By installing sprinkler irrigation systems, the conveyance and application losses are eliminated or significantly reduced, allowing the same quantity of water to be spread over more acreage. In the case of the water users in the Price and San Rafael River basins, the lands are covered under their water rights, but have not historically received a full water supply. It could be argued that this project is appropriating the additional depletion of about 25,000 acre-feet without filing an application. Currently, the State Engineer is holding action on nearly all large applications because the Upper Colorado River Basin of Utah is nearly fully appropriated. If additional water rights are to be granted, it should be through the application process as set forth under the law. On the other hand, it can be argued that the water user is within the limits of his water right, and is not exceeding his water right acreage or diversion allowance. Currently, a lawsuit is before the Utah Supreme Court which partially addresses this issue. The case is Steed vs. New Escalante Irrigation Company, Utah Supreme Court Number 89426. We are hopeful the decision in this case will give us some guidance on this matter.

The issue that needs to be resolved is - Can a water user increase the historical consumptive use under his water right as a result of implementing more efficient irrigation methods? This is a very difficult issue to resolve. In our opinion, you have two fundamental principles which are in conflict. These principles are: 1) The conservation and wise use of water; and 2) The protection of other water rights from impairment. We are presently researching this issue, and hope to resolve it in the near future.

The issue of developing replacement wetlands and wildlife habitat is another area of potential concern. While we do not oppose such development, we have questions about how the water rights to cover such development will be acquired. Within the Upper Colorado River Basin of Utah, the State Engineer presently has a policy of only approving applications to appropriate water for quantities up to 0.10 cfs or 4.73 acre-feet for the irrigation of 1.0 acre, domestic purposes of one family and stock watering of up to ten cattle. Applications above 0.10 cfs are critically reviewed on subbasin or basin level. On page IV-24, first paragraph, it states that under Utah water law, wildlife and water

fowl production are not recognized as beneficial uses. In researching this issue, we agree with this statement, but wish to clarify that we would accept applications by individuals for the purpose of irrigating marsh lands on their property for wildlife and water fowl habitat. In our opinion, the issue becomes whether land owners are allowed to file applications to appropriate water to cover such development, or whether they are required to do so under existing water rights. For example, individual land owners could be encouraged to acquire shares of stock and transfer these water rights to accomplish this objective.

In addition to the above comments, we offer the following specific comments for your consideration:

Page I-2, footnote; it is suggested that the footnote be re-worded to indicate the 1922 Colorado River Compact apportioned the waters between the upper and lower basins. The 1948 Upper Colorado River Compact apportioned the waters between the states of Wyoming, Colorado, Utah, and New Mexico. It is also suggested that the word "guaranteed" not be used.

Page II-11; concerning the issue of winter water for stock watering purposes, it appears that many of the local water users have some concern over the proposal. It is suggested that the Bureau of Reclamation and Soil Conservation Service look at ways of allowing the companies to lease or transfer their withdrawals during the winter months. By doing so, the companies would be able to maintain their winter water right while at the same time accomplishing the objectives of the project.

Page III-2, paragraph 2; the Carbon Canal has a winter right for 21.5 cfs not 25 cfs.

Page III-2, paragraph 3; from our hydrographic survey maps, the acreage for the Ferron Creek drainage has been determined to be 14,498 acres. The Moore area served by the Independents Canal from Muddy Creek acreage is 2,029.80 acres.

Page V-20, table 5-6; the capacity of Cleveland Reservoir is 5,340 acre-feet and the capacity of Huntington Reservoir is 5,616 acre-feet.

We appreciate the opportunity to review this draft EIS, and hope that our comments are of use to you. In providing these comments, we do not want to imply that we do not support the project, rather we do have some concerns regarding the potential impact on existing water rights and want to ensure that all water right holders are protected. Please feel free to contact Robert Morgan or any of the Water Rights staff for any assistance you may need.

The Committee appreciates the opportunity to review this proposal. Please direct any other written questions regarding this correspondence to the Utah State Clearinghouse at the above address, or call Carolyn Wright at (801) 538-1535 or John Harja at (801) 538-1559.

Sincerely,



Brad T. Barber
State Planning Coordinator

BTB/rpj

Statement of

D. LARRY ANDERSON, DIRECTOR
UTAH DIVISION OF WATER RESOURCES

on

Price-San Rafael Rivers Unit
Planning Report/Draft Environmental Impact Statement

November 12, 1991

My name is Larry Anderson, and I am speaking today in my capacity as Director of the Division of Water Resources (although my responsibilities as Interstate Stream Commissioner and Chairman of the Colorado River Basin Salinity Control Forum would also dictate an interest in this project).

Utah has supported the Colorado River Basin salinity control program since its inception in 1974. Although water users in Utah are not directly affected by salinity levels in the mainstem Colorado River, we realize that salinity is a basinwide problem, and the majority of cost-effective salinity control projects are located in the Upper Basin states. In order to comply with federally-mandated water quality regulations, and to maintain the interstate comity so essential to development of Colorado River resources, there is really no choice but for the state to actively participate in this basinwide program.

It is especially gratifying to those of us with long association in this effort to see salinity control projects which not only produce water quality benefits, but deliver substantial benefits to local water users as well. The Price-San Rafael Rivers Unit is certainly one of these.

It has never been easy to make the San Rafael Desert (or Carbon County) 'blossom like a rose'; management of the area's meager water supply doesn't come cheap, either in dollars or in effort expended. While the cost-sharing provisions for irrigation system improvement under the Price-San Rafael Unit may not decrease the workload of you farmers and ranchers, hopefully there will be a positive impact on your 'bottom lines'. Based on our experience with the Uinta Basin Unit in Duchesne and Uintah counties (where nearly \$25 million has been spent for on-farm salinity control practices over the past eleven years) your benefits over the long-term will be substantial.

Of particular importance to the salinity control program as a whole is the fact that this is the first unit developed from the ground up as a joint Reclamation/USDA project. This process not only results in better and more efficient coordination, but maximizes the potential for cost-efficient salt removal. The downside was that new procedures and practices related to joint planning had to be designed, tested, and refined; understandably planning costs, both time and money, were increased. We feel that it was well worth it; in our opinion the Price-San Rafael Rivers Unit Planning Report/draft EIS is an excellent product, and the methodologies developed will be applied in the several joint salinity control planning efforts anticipated in the near future. (Although from a policy standpoint we have no significant technical or policy problems whatsoever, no document can ever be perfect, and we do intend to submit

some written comments of a minor nature prior to December 23.)

Concluding, we feel the Price-San Rafael Rivers Unit is worthwhile from both a water conservation and a water quality control standpoint; it will benefit local areas by providing assistance for improvement of irrigation systems, will benefit the Lower Colorado River Basin states by reducing salinity levels on the lower mainstem, and will benefit the nation by helping insure that federally-imposed water quality standards are met. But you water users are the key factor; without your support and participation the project will not move. Authorization for the Bureau of Reclamation portion must still be given by Congress, and funds must still be appropriated each year. The State of Utah will support whatever you local water users decide.

STATEMENT
TO
THE BUREAU OF RECLAMATION
AND
THE SOIL CONSERVATION SERVICE

CONCERNING
THE PRICE-SAN RAFAEL RIVERS UNIT, UTAH
PLANNING REPORT/
DRAFT ENVIRONMENTAL IMPACT STATEMENT

by
Jack A. Barnett
Executive Director
Colorado River Basin Salinity Control Forum

November 1991

The Colorado River Basin Salinity Control Forum (Forum) met in Yuma, Arizona, this month and considered the Planning Report/Draft Environmental Impact Statement and the Forum's position with respect to the Price-San Rafael Rivers Unit of the Colorado River Water Quality Improvement Program. The Forum asked me to attend this meeting and to express the Forum's strong support for the implementation of this unit. The Forum urges the two federal agencies to continue to work cooperatively to expedite the planning and the filing of the environmental documents so that the salinity strategies in the program can be implemented.

The water quality standards of the Colorado River, adopted by the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, call for a salinity control program which will keep the salinity levels in the Colorado River at or below levels measured in 1972. Under the Clean Water Act, the States are required to formally adopt a plan for salinity control every three years. Each of the States submits that plan to the Environmental Protection Agency for approval.

The last triennial review prepared in 1990 includes as a part of the plan for salinity control the Price-San Rafael Rivers Unit. The reduction of 161,000 tons of salt annually from the Colorado River System by this salinity control unit is most important to the overall program. The combined cost-effectiveness of \$39 per ton of salt removed is very favorable when compared with other salinity control options in the Colorado River Basin available to the Forum.

The Forum wishes to commend the Department of Agriculture and the Department of the Interior for working together in the preparation of a joint plan. This effort has required cooperation and coordination across agency lines which has not occurred in the past. By the combining of efforts, a much larger amount of salt can be reduced to the Colorado River from the Price-San Rafael Rivers Systems, and at significant cost savings. The Forum has, in the past, encouraged the agencies to work together in this study. Now, in addition to thanking the agencies for their concerted effort, the Forum urges the agencies to cooperatively move ahead in an expedient manner to address any issues which might be brought about by the public hearings now being conducted and to move to the authorization of the portion of the project that requires authorization under procedures the Congress requires of the Bureau of Reclamation. The Forum stands ready to help the agencies in any way to expedite the efforts.



STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RIGHTS

Norman H. Bengtson
Governor
Dave C. Hansen
Executive Director
Robert L. Morgan
State Engineer

1636 West North Temple, Suite 220
Salt Lake City, Utah 84116-3156
801-538-7240

January 23, 1992

Ms. Marilyn O'Dell
Soil Conservation Service
PO Box 11350
Salt Lake City, UT 84147-0350

Re: Price/San Rafael Salinity Control Project

Dear Ms. O'Dell:

The Division of Water Rights has reviewed the draft environmental impact statement and planning report for the Price/San Rafael Rivers Salinity Control Project. From our review of the document, there are two major water right issues which are of concern to us. These issues are: 1) If the project is implemented as recommended it will increase the depletion to the Colorado River by about 25,000 acre-feet per year; and 2) The water right issue related to the replacement of wetland and wildlife habitat.

From reviewing the document, it appears that the increased depletion under this project will result from the improvements proposed to the irrigation conveyance systems and converting from flood irrigation to sprinkler irrigation. The State Engineer is supportive of water users improving their water use efficiency but at the same time we must ensure that all water rights are protected. On many river systems in Utah, the water users on the lower reaches have historically relied upon irrigation return flows to supply all or a portion of their water rights. As an irrigator converts to more efficient irrigation methods, it raises a number of legal and institutional issues. The report appears to document this issue fairly well. The section on pages II-9 through II-11, entitled "Existing Irrigation Systems and Practices," appears to accurately describe the historical practices. In table V-5, page V-13, it indicates that 12,310 acres presently receive only a partial water supply. Under the Resource Protection Plan these lands would receive a full water supply as a result of the increase in irrigation efficiency.

It appears that these partially supplied lands have received the majority of their water supply during the runoff period and suffered shortages during the late summer. By installing sprinkler irrigation systems the conveyance and application losses are eliminated or significantly reduced, allowing the same quantity of water to be spread over more acreage. In the case of the water users in the Price and San Rafael River basins the lands are covered under their water rights but have not historically received a full water supply. It could be argued that this project is

Ms. Marilyn O'Dell
January 23, 1992
Page 2

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The issue of developing replacement wetlands and wildlife habitat is another area of potential concern. While we do not oppose such development, we have questions about how the water rights to cover such development will be acquired. Within the Upper Colorado River Basin of Utah, the State Engineer presently has a policy of only approving applications to appropriate water for quantities up to 0.10 cfs or 4.73 acre-feet for the irrigation of 1.0 acre, domestic purposes of 1 family and stock watering of up to 10 cattle. Applications above 0.10 cfs are critically reviewed on a subbasin or basin level. On page IV-24, first paragraph, it states that under Utah water law, wildlife and water fowl production are not recognized as beneficial uses. In researching this issue, we agree with this statement but wish to clarify that we would accept applications by individuals for the purpose of irrigating marsh lands on their property for wildlife and water fowl habitat. In our opinion, the issue becomes whether land owners are allowed to file applications to appropriate water to cover such development or whether they are required to do so under existing water rights. For example, individual land owners could be encouraged to acquire shares of stock and transfer these water rights to accomplish this objective.

In addition to the above comments, we offer the following specific comments for your consideration:

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Ms. Marilyn O'Dell
January 23, 1992
Page 3

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Page II-11; concerning the issue of winter water for stock watering purposes, it appears that many of the local water users have some concern over the proposal. It is suggested that the Bureau of Reclamation and Soil Conservation Service look at ways of allowing the companies to lease or transfer their water to the various delivery systems to cover their withdrawals during the winter months. By so doing, the companies would be able to maintain their winter water right while at the same time accomplishing the objectives of the project.

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We appreciate the opportunity of reviewing this draft EIS and hope that our comments are of use to you. In providing these comments we do not want to imply that we do not support the project, rather we do have some concerns regarding the potential impact on existing water rights and want to ensure that all water right holders are protected. If I or my staff can be of any assistance as you move forward with this project, please feel free to contact me.

Sincerely,



Robert L. Morgan, P.E.
State Engineer

RLM/wk

pc: Mark Page
State Planning Office
D. Larry Anderson, Division of Water Resources



SOUTHERN UTAH WILDERNESS ALLIANCE

1471 South 1100 East
Salt Lake City, UT 84105

December 23, 1991

Regional Director
Bureau of Reclamation
125 South State St.
P.O. Box 11568
Salt Lake City, UT 84147

To Whom This May Concern:

Enclosed are the comments of the Southern Utah Wilderness Alliance on the proposed Price-San Rafael Rivers Unit of the Colorado River Water Quality Improvement Program.

1) While we applaud efforts to reduce irrigation inefficiencies, this proposal apparently would make the salvaged water available for irrigation on marginally irrigated lands. The EIS, however, fails to consider the addition of salts to the river system from these areas which would be irrigated more intensively upon project implementation. It appears more consistent with the spirit and intent of the Colorado River Water Quality Improvement Program that the federal government should dedicate the salvaged waters through asserting federally reserved water rights for dilution purposes to improve water quality.

2) The EIS fails to discuss Utah's water policy on salvaged water. Would salvaged water be available to these same irrigators? Would they have to apply for new appropriations? Is water inefficiently used considered a beneficial use or is it lost through forfeiture?

3) The EIS fails to adequately quantify how much salinity comes from natural sources in the project area versus agricultural-related sources.

4) The EIS fails to adequately consider the alternative of simply buying out irrigation water rights in the project area. The federal government, according to the EIS, would be responsible for about \$70 million of the project costs. When the Intermountain Power Project was built near Delta, water rights were purchased for between \$350 and \$700 per acre foot. The water was previously used by irrigators in the Delta-area to grow alfalfa and alfalfa seed, similar to the uses in this project area. Thus, utilizing these funds to purchase water rights for dedication to dilution purposes would yield the Colorado River Salinity Control Program between 100,000 and 200,000 acre-feet of water which would remain in the streambed and not contribute to the salinity problem. This would provide a definitive solution to the problem rather than one with

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a finite project life, as proposed in the EIS. The final EIS should wholly consider this alternative and alternative scenarios should be developed to assess the impacts of varying levels of buy-outs. Simply deferring to the "state's preference" for maintaining lands under cultivation without referencing any source is illegitimate and violates the APA and NEPA. (EIS, p.III-5) Perhaps the individual farmers, most of whom use farming as a supplement to other sources of income, prefer otherwise. Surveys should be carried out to determine this information. Buy-out is a highly viable alternative which must be considered in the final EIS. The federal government has spent far more money to construct the desalination plant near the Mexican border at Yuma than it would have spent buying out water rights in the lower Gila Valley which caused much of the salinity problem in the first place. In the absence of learning from previous mistakes and considering a buy-out, what SCS and Bureau of Reclamation are proposing here is just another ill-conceived pork-barrel project which, if the purview were expanded to include all reasonable alternatives, has much more cost-effective solutions. The federal agencies need not limit the analysis to simply wholesale buy-out or no buy-out. Alternative intermediate levels of buy-out should also be examined. Please provide a detailed analysis justifying the assertion that wholesale buy-out would cost \$200 per ton of salt removed. (EIS, p.IV-33)

5) The EIS fails to provide a data source for footnotes 2 and 3, Table IV-1.

6) The EIS fails to consider how much water is necessary for a leaching requirement. If irrigation is occurring on naturally saline Mancos shales, a relatively large leaching requirement is necessary to flush salts from the root zone.

7) What is the target irrigation efficiency for the project?

8) Making only "reasonable" efforts to avoid disturbance to the golden eagle is not good enough and could constitute a violation of the Migratory Bird Treaty Act. (EIS, p.IV-20)

9) How much salt will be contributed from the wetlands created as part of the mitigation?

10) The cost-benefit analysis should incorporate a component to quantify the forgone benefits to the consumptive wildlife users who would be adversely affected by project implementation. (EIS, p.V-37)

11) The EIS fails to adequately identify impacts of the stream flow reductions associated with project implementation on the round tail chub and other non-game fish species. Inventories should have already been completed to determine the range, habitat needs, and other potential impacts of the proposed project on the chub and other fish species. Failure to complete such inventories would render the federal agencies unable to adequately describe the affected environment and to analyze potential impacts, thereby violating NEPA.

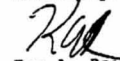
12) The EIS fails to consider whether implementation would adversely affect the eligibility for the San Rafael River to be designated "Wild and Scenic."

13) The EIS fails to consider the impacts of the proposed project on the wilderness suitability of the Mexican Mountain and Sid's Mountain WSAs due to diminished streamflows in the San Rafael River.

14) In the cumulative impact analysis section, it is admitted that the cumulative impacts of this project on the round tail chub are unknown. Therefore, we request that the federal agencies work with the Utah Division of Wildlife Resources and promulgate a mitigation plan to ensure adequate protection for the chub.

I appreciate the opportunity to participate in this process and look forward to receiving the final EIS upon completion.

Sincerely,



Ken A. Rait
Issues Coordinator

ORIGINAL
FB.
UTAH FARM BUREAU FEDERATION
 5300 SOUTH 300 WEST, SUITE 200, SALT LAKE CITY, UTAH 84123

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Keyword		

January 31, 1992

Bureau of Reclamation
 Attention: UPO-712
 P. O. Box 51338
 Provo, Utah 84605

To Whom it May Concern,

We at the Utah Farm Bureau Federation represent the majority of farmers and ranchers in the Carbon-Emery county area and all of Utah. There are organized county farm bureaus in both Carbon and Emery, with approximately 700 member families total.

We appreciate the opportunity to comment on the Price-San Rafael Rivers Unit, Draft Environmental Impact Statement of the Colorado River Salinity Control Program.

Representing agriculture in the arid west makes us aware of the importance that water plays in producing food and fiber for our hungry nation. We in the United States pay only 11% of our income (the lowest in the world) for our food. The wise use of our resources and productivity of our farmers makes this possible.

As a result of Farm Bureau's "grass roots" policy development process which comes from each local area through elected delegates, we have some official policy direction regarding this Draft Environmental Impact Statement.

We support the completion of the Price-San Rafael Salinity Control Program, but we want to be assured that throughout the duration of building the project and after its completion the private property rights of landowners are protected.

In order to maintain the productivity and freedom of these agricultural producers, the sanctity of our private property rights (which are given by our constitution) must be upheld. In addition to our support we would recommend that you work closely with local irrigation companies and other local entities to ensure the most efficient use of the tax dollars to be spent on this project.

We appreciate this opportunity to comment regarding this Draft Environmental Impact on the Colorado River Salinity Program.

Please keep us informed of what happens as a result of our comments throughout the completion of this project.

Sincerely,

Wayne Urie

Wayne Urie
 Central Region Manager
 Utah Farm Bureau Federation

cc: C. Booth Wallentine
 Jay Humphrey
 Verdis Barker

M. Reed Balls
 Tracy Behling
 Hal Lemon



CASTLE VALLEY SPECIAL SERVICE DISTRICT

P.O. BOX 877
CASTLE DALE, UTAH 84513
TELEPHONE (801) 381-5333

November 13, 1991

DORR W. HANSON
Chairman
DARREL V. LEAMASTER
Manager

Attn: UPO-712
Bureau of Reclamation
P. O. Box 51338
Provo, Utah 84605

Re: Price - San Rafael Rivers Unit,
Colorado River Salinity Control Program
Comments on the Planning Report/Draft
Environmental Impact Statement

Gentlemen:

Please include this letter in the record of the Public Hearing concerning the Price - San Rafael Planning Report/Draft Environmental Impact Statement. (EIS)

The Castle Valley Special Service District (CVSSD) provides culinary water, secondary irrigation water, sewer service, and transportation services (roads) to the seven communities in Western Emery County. As part of our responsibility, we operate and maintain the Orangeville and Castle Dale Water Treatment Plants. We have a vital interests in the proposed Cottonwood Creek Line that would provide water to the treatment plants. It is our understanding that this proposed line would replace the winter time deliveries of municipal water through the Mammoth canal. Although it is not clearly stated in the EIS, it is our understanding that this pipeline would replace all water deliveries through the canal to our water plants. In other words, it would be operated year round and not just during the winter time.

We would like to go on record as being in favor of this proposed Cottonwood Creek Line. We believe that it would benefit our water supply system by providing a higher raw water quality at the treatment plant. Water delivered through the canals is subject to possible contamination from wild life, domestic animals, feedlots, fertilizers, insecticides, herbicides and etc. The enclosed pipeline would greatly reduce this threat of contamination. Winter time deliveries through the canals are often difficult because of ice jams and buildup in the canals, beaver dams, trash buildup and etc. The pipeline would vastly improve the winter time delivery problems. We acknowledge that it would benefit our operation.

Price - San Rafael Rivers Unit,
Colorado River Salinity Control Program
Comments on the Planning Report/Draft
Environmental Impact Statement
November 13, 1991
Page 2

The long range plan of the CVSSD is to build a new water treatment plant up Cottonwood Creek that would provide water for both Orangeville and Castle Dale. When this plan is implemented, then we would like to use the Cottonwood Creek Line as a finished or treated water transmission line from the plant to the towns.

This plan creates several questions and problems that are not answered in the EIS. They are:

1. Who will own the finished pipeline? Will the Bureau of Reclamation turn over the ownership to the CVSSD so it could be used for finished water transmission?
2. Who will provide the O&M for the pipeline? Pages IV-16 & IV-54 indicates that CVSSD would be expected to do this. That may create some legal problems if we do not own the facility.
3. Will the pipe materials used during construction be suitable for the pressure we would need for treated water deliveries to the towns, and will it be NSF approved for carrying treated culinary water?
4. The proposed plan calls for several interconnects from the Cottonwood Creek Line to the existing livestock watering system. When we build the new water treatment plant, this would then require that treated water be delivered to the livestock lines. This would be unacceptable to us and to the stock watering system:

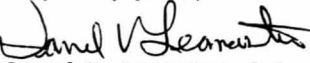
The CVSSD also operates the pressurized secondary irrigation systems for Castle Dale, Orangeville, Huntington, Cleveland and Elmo. They take their water deliveries from the canals that will be involved with the elimination of winter water. These systems are used to water lawns, shrubs, gardens and etc. in the communities. They often demand water earlier in the year (April 1st) and later in the fall (Oct 31st) to water these items. The EIS does not really define when the winter water will be taken out of the canals. Will this decision be made by the local irrigation company, or will it be mandated by the Bureau of Reclamation? Will we be given consideration for an extended watering schedule with the secondary irrigation systems?

Price - San Rafael Rivers Unit,
Colorado River Salinity Control Program
Comments on the Planning Report/Draft
Environmental Impact Statement
November 13, 1991
Page 3

As you can surmise, we are generally in favor of the project. However, we have several questions about the details fo the Cottonwood Creek Line and winter water elimination that need to addressed before we would give full approval.

Thank you for the opportunity to make these comments a part of the public record.

Very truly yours,


Darrel V. Leamaster, P.E.
District Manager



CARBON COUNTY
PRICE, UTAH 84501

November 12, 1991

Regional Director
Bureau of Reclamation
125 South State Street
P.O. Box 11568
Salt Lake City, Utah 84147

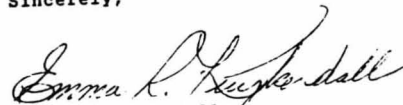
Dear Sir:

We would like to express our interest in your Planning Report/Draft Environmental Impact Statement of Price - San Rafael Rivers Unit, Utah.

We have made a cursory reviewed of this proposal and approve this plan.

We wish to lend our support to your efforts and hope you will keep us informed on the program's progress.

Sincerely,


Emma R. Kuykendall
Commission Chairman
Carbon County

ERK:lb

cc: Jack Soper

Castleland Resource

Conservation & Development Council, Inc.

January 16, 1992

Jan Anderson, District Conservationist
Soil Conservation Service
350 North 400 East
Price, Utah 84501

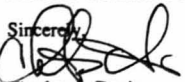
Dear Mr. Anderson:

The Castleland RC&D strongly supports the Price San Rafael Salinity Project. Due to the economic conditions, water shortages, and the salinity problems in this area the Salinity Project is needed without question.

The options that become available with this program can improve the outlook for the entire area. Sprinklers alone will provide opportunities to the farmers and ranchers that they have been unable to afford. In addition the alternatives in crops and new crops would be a viable option that has not been available, while stopping the salts from entering the water table.

Please be assured the Castleland RC&D is in support of this program.

Sincerely,


Charles A. Davis
Chairperson

FERRON CANAL & RESERVOIR CO.

P. O. Box 56
FERRON, UTAH 84523

Nov. 8, 1991

Jan Anderson
Soil Conservation Service
350 North 400 East
Price, UT 84501

Dear Jan:

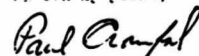
The Ferron Canal & Reservoir Co. is still in full support of the Price San Rafael Salinity Project.

As has been stated before, we had members attend the tour to the Uintah Basin to view what had been done there. We feel this same type of project can be done in the Ferron area to improve our farm irrigation systems. We also need to look at more stock watering lines in our area to take care of livestock watering needs.

These projects will help to reduce the salinity discharge from the Ferron Canal.

We encourage the Bureau of Reclamation and the Soil Conservation Service to proceed as rapidly as possible in getting this program to the implementation stage.

So sincerely yours,


Paul Crawford
Secretary

"BEST COPY AVAILABLE"

FERRON CANAL AND RESERVOIR COMPANY

SALINITY PROGRAM

Comments by Tracy Behling, President

We appreciate the chance to participate in this discussion and to make comments on the program.

The Ferron Canal and Reservoir Co. is very concerned with conservation of water and with the efficient use of the water we have. There is only so much water on the watershed. With municipal and industrial users using more water all the time the amount available for agriculture is shrinking. In addition the amount of storage water is constantly decreasing due to silt accumulation in the reservoir.

Over the last five years the company board has been trying to find ways to fund irrigation improvement projects such as lining the canals, diversion structures, etc. These projects all get to be very expensive so we have looked at ways of getting state or federal money to help with them. We looked at getting money from the Ferron watershed improvement project and the non point source pollution project, but after looking at each project the salinity program looked like the best option. We think the salinity program is the best way for us to accomplish the things we would like to do.

We have some concerns with the project. We can not let it have any effect on our water rights. We want to retain local control. There is some concern that with more water going for municipal and industrial uses that farmers will lose control of the water. The project should be set up so that the farmers maintain control of their water. We have a lot of flexibility on our system. Our water is not tied to any one piece of land. Water in the North Ditch may be transferred to and used in the South Ditch and vice versa. We do not want to lose this flexibility. From what we have seen of the other projects we should be able to maintain local control and flexibility.

Millsite Reservoir has been identified as one of the top 25 high risk dams by the State Engineer. We were inspected this summer and as a result of this we will be required to make significant expenditures to bring the dam up to the new code requirements. Preliminary cost estimates for these improvements are:

A. Riprap Project	\$93,000
B. Piezometer	\$30,000
C. Seismic Resistance	\$400,000
D. Spillway Analysis	\$400,000

These estimates were made by the state and we believe it will cost a lot more than this to accomplish all of the things they are telling us we will be required to do. The state has put these new requirements on us without providing us with any help to do them. With these requirements it will be extremely difficult to fund new capitol projects for efficiency improvements without a program such as the salinity program.

Our irrigation company board has gone out to the Uintah Basin to see what they accomplished under the salinity program. We were impressed with the project and how it has improved their efficiency. We would like to improve the efficiency of our system and the salinity program seems to be the only way we will be able to do this.

With our current flood irrigation methods we estimate we are probably less than 40% efficient. Many of our farmers have started to use gated pipe which definitely is an improvement but we would like to be able to increase our efficiency above 50%. the only way we see to do this is with sprinkler irrigation. With sprinkler we can be over 60% efficient. We see the salinity program as the only way we can put a significant portion of farms into sprinkler systems.

If the salinity program funds putting laterals in underground pipes we should be able to have water with sufficient pressure to sprinkler irrigate significant portions of the farmland in the Ferron system. With pressure available and with funding help from the salinity program we are sure that many Ferron farmers will install sprinkler irrigation systems on their farms.

We see the salinity program as a once in a lifetime opportunity. If we do not take advantage of it now it will go to the next priority down the line and we will probably lose our chance forever. With the philosophy that is now in the country and in congress it is very doubtful that we will have a chance for any more irrigation projects in our lifetime. We hope that everyone can support the project and get it here. Once the project is here look at the guidelines closely. If you can live with the guidelines sign up for the project, if you can't live with the guidelines don't sign up but lets not kill the project before it gets started.

If we can improve irrigation efficiency, make water available for municipal and industrial uses, and at the same time reduce the salinity in the San Rafael River we have a win/win situation. It is environmentally sound and cost effective compared to the cost of other means of reducing the salt load such as desalination plants, retiring the land, etc. We recommend the project be approved in Emery County.

December 18, 1991

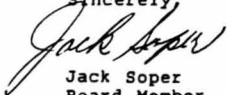
Bureau of Reclamation
Price San Rafael River Salinity Program
East Bay Business Park
P.O. Box 1338
Provo, Utah 84603

Dear Sir,

The Stowell Irrigation Company located in Spring Glen, Utah would like to be included in the Price River Salinity Program. The Stowell Irrigation Company supports the program and believes it will improve the efficiency of delivery of water and irrigation practices along with reducing the salt loading of Price River in the Spring Glen area.

The company is willing to work anyway it can to improve irrigation and reduce the salinity going into the Price River

Sincerely,



Jack Soper
Board Member
Stowell Irrigation Co.
Spring Glen, Utah

December 18, 1991

Soil Conservation Service
350 North 400 East
Price, Utah 84501

At the annual stockholders meeting of the Stowell Ditch Canal Company held on December 6, 1991 a motion was made and passed by the majority in support of the Price-San Rafael Rivers Unit PR/DEIS.

The motion also stated that the Stowell Ditch Canal Company be included in the PR/DEIS. It was felt that the Stowell Ditch Canal Company was not included in the original draft. This was indicated by the maps and subunits of the draft.

Thank You



Rudolph Bruno
Board Member Stowell Ditch Canal Co.
RFD Rt #1 Box 158
Helper, Utah 84526

JAN 13 1992

January 7, 1992

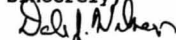
Dear Sirs,

This letter is to let you know of the address change for the Stowell Ditch Company. At the annual meeting of the Stowell Ditch Company, new officers were elected. In order that the new secretary and treasurer receive the correspondence for the Company, we would appreciate your sending all correspondence for the Stowell Ditch Company to the following address until further notified.

Stowell Ditch Company
c/o Dale Wilson
3995 North Spring Glen Road
Helper, Utah
84526

Thank you for your time in this matter.

Sincerely,



Dale Wilson
Secretary, Stowell Ditch Company

WELLINGTON CANAL COMPANY
PRICE, UTAH

January 21, 1992

Jan C. Anderson
District Conservationist
Soil Conservation Service
350 North 400 East
Price, Utah 84501

Dear Mr. Anderson:

The Wellington Canal Company is in favor of implementing the Price-San Rafael Salinity Project. We give total support to this project and are very anxious to see the benefits that it may bring to our area.

We are looking forward to working with the Bureau of Reclamation and Soil Conservation Service in making this project a reality. We are badly in need of such a project and feel that it will benefit the farmers served by our company to improve their irrigation systems in turn improving their farms.

Sincerely,



Phil Thayne
Wellington Canal Company

cc: Reed Murray
Bureau Of Reclamation

ORIGINAL
ORANGEVILLE CITY

5 North Main Street
P. O. Box 677
Orangeville, Utah 84537
Telephone: (801) 748-2651

November 21, 1991

Department of Interior
Bureau of Reclamation
P.O. Box 11568
Salt Lake City, Ut 84147

Gentlemen:

This letter is to express our support for the Draft Environmental Impact Statement on the Price - San Rafael Rivers Salinity Program.

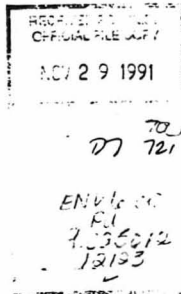
We feel this purposed program will greatly benefit our area.

Sincerely,

ORANGEVILLE CITY

Tom Humphrey

Tom Humphrey
Mayor



CY PPO-700

HUNTINGTON-CLEVELAND IRRIGATION COMPANY

55 North Main
Huntington, Utah 84528
Telephone (801) 687-2505

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JAN 27 1992

January 24, 1992

Regional Director
Bureau of Reclamation
125 South State Street
P.O. Box 11568
Salt Lake City, Utah 84147

SALINITY Planning Report/Draft Environment Impact Statement

This is to inform you that Huntington Cleveland Irrigation Company, Board of Directors, agree with the concept of the Impact Statement, in its broad form, on farm improvements and etc..

Huntington Cleveland Irrigation Company, Board of Directors, can not except or agree with the winter water program, as proposed. We must have a river control storage place for the control of winter water in the Huntington Creek area.

Sincerely,

HUNTINGTON CLEVELAND IRRIGATION COMPANY
BOARD OF DIRECTORS
Box 327
55 North Main
Huntington, Utah 84528

vw

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EFS

CARBON CANAL COMPANY
PRICE, UTAH

January 16, 1992

Jan C. Anderson
District Conservationist
Soil Conservation Service
350 North 400 East
Price, Utah 84501

Dear Mr. Anderson:

We in the Carbon Canal Company would like to go on record as supporting the Price-San Rafael Salinity Project. We have attended the public meetings and discussed specific parts of the project with representatives of the Soil Conservation Service and Bureau of Reclamation at special meetings. We definitely support the on-farm and irrigation improvement portion of the project and feel it will benefit the farmers served by our company. Many of our farmers need to improve their on-farm irrigation systems and this would give them the needed financial assistance to accomplish this.

We do have a concern about the winter water portion of the project, the lining of ponds and how it may affect our water rights. We will need to work closely with our shareholders and the Bureau of Reclamation in addressing these concerns.

Sincerely,


Jack Chiaretta, President
Carbon Canal Company

cc: Reed Murray, Team Leader
Bureau of Reclamation

PRICE-WELLINGTON CANAL CONTROL BOARD
PRICE, UTAH

January 16, 1992

Reed Murray
Project Team Leader
Bureau of Reclamation
P.O. 51338
Provo, Utah 84605

Dear Mr. Murray:

The Price-Wellington Canal Control Board is in support of the Price-San Rafael Salinity project and are very anxious to see it implemented in our area. We have installed some buried pipelines in our area and can see the benefits.

Our Canal Board has been involved in the public meetings and tours and look forward to working with both the Bureau of Reclamation and Soil Conservation Service in making this project a reality.

Sincerely,



Dale Mathis, President
Price-Wellington Canal Control Board

cc: Jan C. Anderson, DC
Soil Conservation Service
Price, Utah



Price River Watershed Soil Conservation District
350 North 4th East - Price, Utah 84501 - Phone 637-0041

January 17, 1992

Jan Anderson
District Conservationist
Soil Conservation Service
350 North 400 East
Price, Utah 84501

Dear Mr. Anderson:

This letter is to inform you of our full support of the Price-San Rafael Salinity Program. We have been active participants in all of the various meetings, tours, etc. and have kept ourselves well informed as the planning phase of the program was carried out.

We feel that when this program is finally implemented, it will give our county a tremendous boost. It will improve our farms with better irrigation systems which will reduce the salinity problem both in our Soil Conservation District and in the Lower Colorado River areas. It will increase production and save irrigation water.

We support this program 100% and encourage your agency along with the Bureau of Reclamation to rapidly complete the planning phase of the program and bring it into the implementation stage as quickly as possible.

We would be willing to sponsor information meetings, tours or whatever we as a SCD could do to get the implementation phase underway.

Sincerely,

Lyle B. Bryner
Lyle B. Bryner, Chairman
Price River Soil Conservation District

Price River Distribution System

Price, Utah 84501

January 17, 1992

Jan Anderson
District Conservationist
Soil Conservation Service
350 North 400 East
Price, Utah 84501

Dear Mr. Anderson:

This letter is to inform you of our continued support of the Price- San Rafael Salinity Program. Our Distribution System serves all of Carbon County as will the Salinity Program thus we will all benefit when the program is implemented.

We are badly in need of a program like this which will let our farmers improve their irrigation systems thus improving their farms. It will reduce the salt load in our soils making them more productive and will make it possible to raise higher quality crops.

We support this program very strongly and encourage the Soil Conservation Service and the Bureau of Reclamation to accelerate their planning efforts so this program may be implemented as quickly as possible.

Sincerely,
Lyle B. Bryner
Lyle B. Bryner, President
Price River Distribution System

December 18, 1991

Soil Conservation Service
350 North 400 East
Price, Utah 84501

At the annual stockholders meeting of the Spring Glen Canal Company held on December 7, 1991 a motion was made and passed by the majority in support of the Price-San Rafael Rivers Unit PR/DEIS.

The motion also stated that the Spring Glen Canal Company be included in the PR/DEIS. It was felt that the Spring Glen Canal Company was not included in the original draft. This was indicated by the maps and subunits of the draft.

Thank You



Frank Saccomanno
President Spring Glen Canal Co.
RFD Rt #1 Box 25 B
Helper, Utah 84526 2107

UTAH POWER

JODY L. WILLIAMS
Attorney
Legal Department

ONE UTAH CENTER

201 SOUTH MAIN • SUITE 2200 • SALT LAKE CITY, UTAH 84140-0022 • (801) 220-2851 • FAX (801) 220-4292

February 25, 1992

FEB 27 1992

DATE	INITIALS	TO
2/27	GW	768
2/27	GW	721
		172
ENV-2		
G/F		
9200-76		
1209-		
EIS		

Roland Robinson, Regional Director
U. S. Bureau of Reclamation
125 South State Street
P. O. Box 11568
Salt Lake City, Utah 84147

Re: DES 91-25

Dear Mr. Robison:

Utah Power and Light Company (UP&L) appreciates the opportunity to comment on the above-referenced Planning Report, Draft Environmental Impact Statement for the Colorado River Water Quality Improvement Program/Colorado River Salinity Control Program (the Draft EIS). UP&L's comments follow:

1. UP&L supports the concept of salinity reduction in the San Rafael and Price River drainages and commends the Bureau of Reclamation (the BOR) and the Soil Conservation Service (the SCS) for work on the Draft EIS. As a major water user and water rights owner in both drainages, water conservation, wise usage practices and salinity reduction are important issues which it is pleased to see jointly addressed by the BOR and SCS. UP&L stresses that any programs advanced by the BOR and the SCS to reduce salinity should be voluntarily adopted by the local water users.

2. UP&L believes that any mitigation package for implementation of the salinity reduction project should be jointly planned, funded and implemented by the BOR and SCS, rather than individually undertaken by each agency. This will reduce duplication of efforts and cost. The BOR should be the lead agency in performing mitigation for the project.

3. It is unclear from the Draft EIS whether water made available from development of the Emery Project on the Cottonwood and Huntington-Cleveland drainages could be used on marginally irrigated and farmed lands. It is UP&L's understanding that the lands within the Emery Project boundaries were surveyed by the BOR prior to execution of contracts for water delivery from the Emery Water Project, and that current Reclamation law and Emery Water Project boundaries prohibit exporting and using project water on non-

Roland Robison, Regional Director
U. S. Bureau of Reclamation
Letter dated February 24, 1992
Page 2

project lands. This section of the Draft EIS needs to be clarified to avoid the appearance that the proposed plan intends to encourage project water use on non-project lands.

4. UP&L believes there is extensive opportunity to reduce salinity by piping canals in the Huntington-Cleveland system. Piping was discussed mostly in connection with the Cottonwood Creek system. Huntington-Cleveland Irrigation Company's canals are longer, and serve a more diverse geographic area. Substantial salinity reduction benefits could be gained by including piping proposals for the Huntington-Cleveland system as well. If users in either the Huntington-Cleveland or the Cottonwood systems do not choose to participate in the proposed program (if it is authorized and appropriated) then the other system users could benefit, and the objectives of the salinity reduction program could be met, if both irrigation systems were included in the proposed program.

5. The Draft EIS needs to be changed to reflect UP&L's uses for its leaseback water. The leaseback water is retained as a cushion for continued plant operation during extended droughts, such as the one ongoing in Emery County. Only in non-drought years where the projected water supply is surplus to the steam electric generating plant needs does UP&L offer water shares for lease back to the Emery County irrigation companies. For the past two years, UP&L has not offered any water for lease back to irrigation companies in Emery County as it has all been allocated for existing steam electric generation plant use. UP&L's current plans do not include using the leaseback water for an additional generating unit at either the Hunter or the Huntington steam electric generating plants.

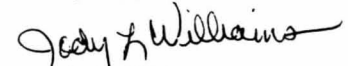
6. UP&L owns property in the vicinity of the Three Forks on the San Rafael as well as several thousand acres of land adjacent to the San Rafael River between the Three Forks area and the confluence of the San Rafael with the Green River. Much of that property is currently under lease to private entities. While the proposed wetland mitigation property is not explicitly identified in the Draft EIS, UP&L believes that its land is some that would be considered for wetland mitigation. UP&L may consider allowing use of its land for wetland mitigation under circumstances meeting its approval if the proposed plan is authorized and funded, and if local agricultural users voluntarily opt to join the salinity reduction program requiring wetland replacement. UP&L's contribution to wetland mitigation could allow farmers who wish to participate in the salinity reduction program the opportunity to do so without taking their privately-owned lands out of production for use as wetland replacement mitigation. Further negotiations would have to set the terms and conditions for use of UP&L's lands as wetland mitigation.

Roland Robison, Regional Director
U. S. Bureau of Reclamation
Letter dated February 24, 1992
Page 3

7. UP&L has offered to purchase the North Emery Water Users Association's water system. If successful, UP&L will turn the system over to Emery County to operate as a special service district.

UP&L hopes that its comments to the Draft EIS are useful and constructive. It appreciates the opportunity to comment.

Very truly yours,


Jody L. Williams

JLW:cld



San Rafael Soil Conservation District
P. O. Box 758 - Castle Dale, Utah 84513 - Phone (801) 381-2300

JANUARY 18 1992

TO: JAM ANDERSON, DISTRICT CONSERVATIONIST
350 NORTH 400 EAST PRICE UTAH, 84501

RE: PRICE-SAN RAFAEL PROPOSED SALINITY PROJECT

As a Soil Conservation District we see this project as a real benefit to our area, not only will this enable the farmers to better utilize their water and be more efficient with the water, it will also increase their ability to better make a living from their farms by opening up more options for crops, such as double cropping, or fall grains, or fall alfalfa seedings.

Water is our number one resource problem, it would appear that it is only a matter of time before we will need to change to sprinklers in our area to make better use of our water, and in fact our very survival in agriculture in this area may depend on this project.

This program offers the farmers an opportunity to put in place a more modern, efficient method of irrigation with affordable costs, due to the cost share portion and the Bureau of Reclamation part of the project.

The project would also reduce the salt in the Colorado river, thus meeting treaty conditions with Mexico.

This project would also be of great economical value to Emery and Carbon counties, bringing in much needed employment opportunities and dollars to both counties.

We would encourage full support from the farmers and give our own support. We would urge prompt funding and quick implementation of this project.

While we realize there will be some bugs or problems to be worked out of this project, we feel that these problems can be solved to everyone's satisfaction as the project moves along.

Sincerely,

Perry Bunderson, Chairman

Perry Bunderson
San Rafael Soil Conservation District
rural rt. 1 Moore Utah 84523
286-2366

EMERY WATER CONSERVANCY DISTRICT

P. O. Box 998
Castle Dale, Utah 84513

Telephone (801) 381-2311

January 20, 1992

Regional Director
Bureau of Reclamation
125 So. State Street
Salt Lake City, Utah 84147

Dear Sir,

The Emery Water Conservancy District covers four (4) irrigation systems; Huntington, Cottonwood, Ferron, and Emery. Two of these systems are regulated by the Bureau of Reclamation and are under the Reclamation Reform Act of 1982 and their amendments of 1987.

The Salinity program of eliminating canals, removing the winter water from the canals, and limiting water use by restrictive sized pipes on laterals will create administrative problems for the District and Huntington and Cottonwood areas if they have to continue to administer their system with two classifications of water and no storage rights for primary water in the Bureau of Reclamation reservoirs.

We recommend the following language as a solution to this problem.

Recommended addition to be added to the August 1991 draft, after the fourth paragraph, Chapter I, page 4, under the heading: PRICE SAN RAFAEL DEPLETIONS:

"The Emery County Reclamation Project (Joe's Valley Dam and Delivery System) has resulted in approximately 48,400 acre-feet of water from the Cottonwood, Huntington, and Ferron water sheds being converted from agricultural to industrial use in the Utah Power and Light (UP&L) electric generation plants. At present UP&L is using about 35,000 acre-feet of water, resulting in a decrease in the salt loading to the Colorado River by about 36,750 tons. When and if UP&L uses their full water rights, the salt loading will be reduced an additional 14,080 tons. This reduction of nearly 50,000 tons of salt loading to the Colorado River has been accomplished because of the Emery County Reclamation Project, and at no cost to the United States. (for further detail see Chapter IV, pages 27 & 28)

The Emery County Reclamation Project was made possible by the stockholders of the Cottonwood Creek Irrigation Company, and the Huntington-Cleveland Irrigation Company, releasing that portion of their decreed water rights to the

Cottonwood Creek Consolidated Irrigation Co.

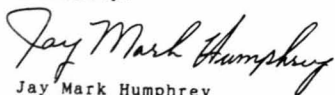
Orangeville, Utah 84537

United States, necessary to make the project possible. Except on very wet years, there is unused capacity in Joe's Valley Reservoir and in the reservoirs of Huntington Creek that is being and can be utilized for exchange purposes in administering the project water. Utilization of this unused capacity for short term storage of primary water and the water saved through the salinity irrigation management and conveyance improvements can be done with no additional costs to the United States, and only nominal O&M costs to the project users. This procedure will increase the participation and effectiveness of the salinity project in the Huntington and Cottonwood sub-units."

The Ferron System seems to be in an area where water conservation and better irrigation practices proposed by the salinity program would be beneficial. We see no real problem with your proposal as long as the individual participation remains on a voluntary basis. If you attempt to change this participation from voluntary to mandatory to meet the Wildlife Habitation and Wetland Retention we would have to take a careful look before we would approve.

The Emery System has two main areas; the Moore system and the Emery Proper system. You have ignored a portion of the Moore system and completely ignored the Emery system. The proposed costs of the Moore sub-unit seems to be very excessive. We will leave the response to this problem to the irrigation companies involved.

Sincerely:



Jay Mark Humphrey
Manager
Emery Water Conservancy District

United States Bureau of Reclamation
Regional Director
25 South State Street
P.O. Box 11568
Salt Lake City, Utah 84147

RE: Price - San Rafael Rivers Unit, Draft EIS

Dear Sirs,

We have many concerns pertaining to the Environmental Impact Statement of the Price San Rafael Unit. The San Rafael River does contribute a great quantity of salt to the Green River. When the Federal Government stopped monitoring the San Rafael, we hired Hansen and Luce Engineering to collect and summarize the data the Federal Government had collected. The San Rafael is salt producing. Since that summary we have continued to monitor the tributaries of the San Rafael. That information is available. Your statement of the irrigation practices of the area, "During the spring run off excess water is used causing deep percolation and increasing the salt run off into the San Rafael etc, etc". This does not necessarily apply to the Cottonwood Creek. The Cottonwood Creek through the Emery County project and industrial and increased municipal water has removed 33,000 acre feet of water from the Cottonwood system - total removal - total consumption - there is no mention of the salt reduction effort in the Draft EIS. Our records show that the Cottonwood Creek contributed 34,392 tons of salt into the San Rafael in the year 1987-1988; 25,929 tons, 88-89; 24,093 tons in 89-90; and 13,567 tons in 1990-1991.

The reduction may have been the result of the drought or wise water management. But the point that I am raising is that the total salt content of the San Rafael did not decrease. This leads us to believe that your 50-50% formula, fifty percent being charged to agriculture and fifty percent to natural and uncontrollable conditions, may be flawed.

We may have to conclude that regardless of water conservation measures the San Rafael will still contribute tons of salt and the effort to restrict and control the agriculture contributions was a waste of tax payer's money.

Your analysis shows that water coming to the farm land brings 56,880 tons of salt and leaves with 300,880 tons and hence picks up 244,000 tons of salt.

Your conclusion is that the bulk of the increase comes from three main sources.

1. Area irrigation during spring run off and unequal distribution of water due to poor irrigation practices during the irrigation season.
2. Leaky canals and water left in the canal for livestock during the winter months.
3. Stock watering ponds for livestock that continue to leak the year round.

Your solution to item #1 is to change the watering system of flooding and continuous flow to a controlled sprinkling system.

You state that all units within the Price-San Rafael district has access to reservoirs. This is not an accurate statement. The Cottonwood Creek surrendered it's primary storage rights to the Emery County Project.

We are aware of that inadequacy and have strongly recommended that reservoir space for our primary water be part of this program. No mention of the needed storage is found in the Environmental Impact Statement. We do not look upon this as an oversight on your part but as a formation of policy to ignore our request.

Another concern that we have expressed is our inability to manage two waters in one wheel line or other sprinkling system. It is very unlikely that we will accept the responsibility of administering an irrigation system without having storage and the right to use our water when and where we feel it is needed.

Another concern deals with your interpretation of the clean water act that makes water from a leaky canal or ditch or lateral belong to the federal government and can not be subject to regulation. This brings us to the base conflict of this salinity program. How are we going to have irrigation improvements without interfering with wetland retentions? From our point of view, it is contrary to wise water management to spend millions drying up man induced wetland caused by leaky canals and uneven distribution of water. Then to create new wetlands to replace the old wet lands. Then to add insult to injury by demanding that a full 4 acre foot/acre water right be given to the newly created wetlands. Your proposal that all of this replaced wetland be placed on Cottonwood Creek is unacceptable to us. It might be advantageous to put this project on hold until the Courts or Congress decides which is more important; "the retention of man made wetlands or the removal of salt from the Colorado River". No program is going to be cost effective in attempting to accomplish both of these conflicting objectives. That brings us to the concerns of the cost.

Irrigation companies in other areas of the state are installing irrigation conservation and efficiency sprinkling systems for \$10, \$20, or \$30 per acre cost.

If we have not miscalculated, the system will cost near \$60 per year per acre for the life of the project. There is an economic law of diminishing returns that applies to agriculture and water system.

The second cause contributing to salt you recognize is winter water and leaky canals. The Cottonwood Creek Irrigation Company attempted to solve this by installing a stock water line for winter use at no cost to the tax payers. We are aware of the inadequacies of our present system and were waiting to hear your solution for improving it. The solution you offer; tying the stock-water line to the culinary water supply is an answer but when culinary water becomes treated water, this solution may cause more problems than it solves.

When the winter water is removed from the Mammoth Canal. The livestock watering along that canal has not been adequately treated in the plan. Those users need to have a better understanding of how these winter water uses will be supplied.

We prefer a stock watering system without the cost of treated water. The irrigation company is also concerned about who will maintain the system.

Another major concern deals with your proposal to treat only 6,430 acres of land under the project.

We have 12,000 acres of irrigated land. We are concerned how the land under your proposal is going to be treated when the canals are eliminated and the water use is restricted by limited pipe size on these laterals.

The last issue of stock-watering ponds. Your proposal of making these ponds wild life habitat ponds and restricting the use by livestock will create more problems than will be solved.

The attempt to get around the Utah State Water law, which does not recognize water for a water fowl as a beneficial use, if used by private individuals, but if the water right is transferred to the F.W.S. that pond for water fowl becomes legal. This could become a deterring factor. Our relationship with the Reclamation Reform Act has made us very cautious about signing any contract with an agency that is subject to constant change.

The proposal of reducing a state appropriated water right by a more efficient method of water management is acceptable, but to deny the original appropriator the right to use that water is unacceptable.

Another concern that needs further clarification is the monitoring and evaluation agreement. We need to know what the SCS is expecting to accomplish on each private property unit.

We have other concerns which are attached.

Sincerely,

Eugene Johnson
President

Don C. Huntington
Vice President

Archie Johnson

Frank Johnson

Craig Johnson

Ed Johnson

Ken C. Johnson

Board Members
Cottonwood Creek Consolidated
Irrigation Company

RESPONSE TO PLANNING REPORT/DRAFT ENVIRONMENTAL IMPACT STATEMENT
Price - San Rafael Rivers Unit, Utah
Board of Directors
Cottonwood Creek Consolidated Irrigation Company

1. Page IV-20, indicates that 330 Acres of artificial, irrigation induced wetlands will be lost due to the project and will require mitigation.

The Board takes issue with that estimate. Since water is being left in the canal during the growing season, the wetlands will still receive the necessary seepage to be sustained.

We recommend a mitigation program based on actual loss to be determined by inventory taken as the project proceeds.

2. Page IV-20 indicates that the wetland mitigation for the entire unit come from Cottonwood Creek. That 380 Acres would be purchased along with 640 Acre-foot of water.

The board objects to the entire mitigation being placed on Cottonwood Creek, which represents only 20% of the planning unit. The plan, if implemented, would eliminate three farm families and significantly alter the operations of 10 other farm families. We object to the recommendation that a full water right is required.

The board recommends that the mitigation be spread across the unit. Any water purchased and transferred from Cottonwood canals will be required to leave 12% in the system to cover distribution losses.

3. Page IV-24, A payment of \$10.91 per acre-foot of Colorado River depletion is required by an undetermined entity.

The board objects to this obscurity and perceives that the "undetermined entity" will be the participating farmer.

We recommend that the entity be identified in the final report as well as the method of payment.

4. Page IV-26, The plan calls for irrigation companies to convert from a fixed-schedule delivery to demand delivery of irrigation water.

The board objects to the blanket implication that this is the most efficient method of distribution of water. We object to the fact that the preparers have provided nothing in the plan to assure the demand type delivery. Intermediate storage would be required. Increased canal capacity would be

required. Assumed pipeline sizes listed in the plan (page IV-11) are undersized for a demand delivery system.

The board recommends that the planning concepts and associated cost estimates in the proposal be more realistic with the recommendation of the planners.

5. Page VI-5, The plan lists two concerns previously expressed by the Cottonwood Creek, and states that "both issues are addressed in the preferred plan".

The board reminds the preparers that the issue of storage in the Joe's Valley Reservoir has not been addressed at all. The board feels that Cottonwood Creek is being discriminated against since it is the only unit with storage restrictions. The board feels that distribution of project water to project lands will be almost impossible to control and certify under the requirement of the RRA.

The board recommends that storage be made available. We recommend that the final plan calls for a change in USBR policy so that water distribution can be made without RRA restrictions.

6. Page IV-19, The plan suggests that USBR will reimburse canal companies for increased Operation and Maintenance costs to implement the project. The plan then identifies \$11,829 per year to Cottonwood Creek for this purpose.

The board objects to this amount as being grossly underestimated. The board recommends that at least one full time employee will be required to administer the program. The cost of this employee is estimated at \$50,000 per year. In addition, annual maintenance costs on all improvements will be required. The final plan should more adequately address this issue.

7. Cost/benefits to the participating farmer have been ignored by the planning report. Using general estimates taken from pages IV-16 and IV-50, it is estimated that there will be a cost to the participant of about \$60.00 per acre per year. This cost has been obscured in the planning effort.

The board recommends that the planners make sure that the participant understands the cost of the project that will be born by them and provide a proper benefit ratio for the on farm costs.

8. Page IV-50, The Cottonwood Creek M & I line is proposed.

The board supports the concept but sees a problem with the company's livestock watering system connected to it. When the cities place treated water in the system, the stockmen will have to pay for treated water to water livestock.

The board will insist that the livestock watering system remain a raw water system. We recommend that the two systems remain independent.

9. The planning report has ignored all complications that the proposed plan has with local water rights. The board feels that this is a major oversight and recommends that the final report address the issue.
10. The distribution list is an embarrassment to the planning process. The board recommends that the list be expanded to include the entities that are directly involved with the proposed project.
11. The planning report obscures the requirements of post-project monitoring and evaluation that the SCS is mandated to carry out. The board recommends that the monitoring and evaluation criteria be expressed in detail.
12. Project concepts are general. The board reserves their comments and any approval until a site specific plan is proposed.

November 13, 1991

To whom it may concern:

The following is my response to the E.I.S. for the Price/San Rafael Rivers Units--"the salinity project."

The concept to reduce the salt in the Price and San Rafael Rivers is valid and I support the concept. However, the E.I.S. is full of flaws and intelligent people should not adopt it as it is written. I will first address the flaws that can be fixed.

TO WHOM IT MAY CONCERN:

I, Montell Seely, of Castle Dale, Emery County, Utah, am opposed to the Planning Report draft, Environmental Impact Statement for the Price, San Rafael River Salinity Control Program. However, I support reducing the salt content of the San Rafael River.

I am also in favor of using our water more efficiently. But I am adamantly opposed to the above named program. There are two points that I want to stress:
(1) I own my water rights. I have a right to apply my water onto my land, and I have a right to let the runoff run into Cottonwood Creek. And I have no obligation to do anything to change the salt content of the runoff.

I want to say that loud and clear, so I repeat: I have the right to put my water on my land, and I have the right to let the runoff go into Cottonwood Creek. And I have no obligation to do anything to change the salt content of the runoff.

No federal agency or police agency can take that right away from me. And if the farmers ever sign any agreement wherein they give up that right, they are fools; they are stupid fools.

(2) This program, Planning Report draft, Environmental Impact Statement for the Price, San Rafael River Salinity Control Program, is NOT of the people of Emery County. It is not for the people, and it was not written by the people.

It is of the Bureau of Reclamation. It was written by the Bureau of Reclamation. And it is for the Bureau of Reclamation.

I am not suggesting that those who wrote this proposal go back to the drawing board and write a new proposal. I don't want that. I don't want any program written by the Bureau.

If the Federal Government will pay us the money, we will reduce the salt content in the River.

Montell Seely
by Montell Seely

1) It was written to benefit the wetlands advocates, the wildlife, the endangered species, and the lower Colorado River people who don't want our salt. It is not written to benefit the family farms located within the boundaries of the project.

The very people who own the land and the water within the E.I.S. project boundaries were ignored. They were not consulted. You might rebut that and say, "We talked to your representatives." I say, "That is not good enough. When you design projects that directly affect me and my land and my water, you talk to me!"

Government agencies throughout the United States are guilty of ignoring the private landholder. They make all kinds of rules and regulations that take away our private property rights.

The tone of the E.I.S. is no exception. The tone of the E.I.S. causes me to feel that the writers felt like they were dealing with government-owned land and water. The writers consulted every special interest group for input but the private landholder and water owner was left out. The writers consulted with other agencies and interests--Division of Wildlife Resources, Core of Engineers, Wetlands, Wildlife Habitat, Clean Water Act, Endangered Species--all these got their say so, but not the persons who own the land and water.

2) The E.I.S. says it will pay 100% of off-farm project costs and 70% of on-farm project costs. That is the pied piper's carrot and sounds good--sounds enticing--and some have sunk their teeth into the carrot; but, I believe they have not read between the lines--they have not read the "fine print." They are not seeing the whole picture. They are not recognizing all of the added costs and regulations that will be imposed on them when they participate in this salinity project. For example:

My neighbor, Ross Hinkins, has sprinkler lines. He has a natural gas powered pump to produce his pressure. I irrigate with open ditches and furrows. We are on the Blue Cut Canal so our water assessment per share is identical. But to his water expenses he has to add the following: 1) The pumping cost paid to Mountain Fuel Supply. 2) The amortised cost of his sprinkler line. (In this project, that will only be 30% of the total cost, but it is still a cost that the farmer has to add, and it is a cost that I do not now have.) 3) The cost of repairs and maintenance. This includes wages for farmworkers. (Boy, many, many times I have seen the Hinkins' hired man spend all day standing out in the muddy field repairing a wheel line--a time factor and an expense that I don't have to deal with.) 4) The cost of replacing parts that

wear out. 5) The interest on his investment. 6) The cost of time. It takes three times longer each day to irrigate with sprinkler lines than with open ditches.

Add all of the above-listed expenses and multiply the sum by years. The result: he cannot raise enough alfalfa to pay his added expenses. It is a net loss proposition for him to have sprinkler lines.

The bottom line is that they (the farmers) will have less net income (or more net loss) by participating in this project. In other words, if the farmers enter this project, they will, in reality, subsidize the salt removal from the Colorado River. They won't break even--they will come out with the short straw. If a farmer is willing to change his irrigation system and reduce the salt in the river, the government or others should pay 100% of off-farm expenses and 100% of on-farm expenses (including the added costs that I mentioned above).

3) You say your prime objective is to reduce the salt in the San Rafael river. I say that is phoney. The E.I.S. protects wetlands more than it reduces salt. It is the water that carries the salt from the land to the river. If there was no water running off and through the land into the river there would be no salt. It is that simple.

Page IV-20 says that 330 acres of wetland will be lost as a result of the project. From what I understand, you will buy that many acres along with a full water right someplace else in the area and create 330 acres of wetland so that there will be no net loss in wetland. That doesn't make sense. The 330 acres of wetland that is managed by the Division Wildlife Resources will always continue to dump salt into the river. You're not going to reduce the salt unless you dry up some wetland!

The thing that burns my gizzard is that you (government agencies and special interest groups) want control over it because it is wetland. We, the farmers, own it. We made it wetland, but you claim control over it. The way the government has taken control over wetland is a blatant, arrogant, communistic, socialistic, high-handed piracy of private property rights, and I hate it with a passion.

When my grandfather and his companions brought their sheep and cattle into this valley in 1875, 117 years ago, they dipped their culinary water directly out of the Cottonwood Creek. There was no salt in the creek water because there was no water running off or through the land into the creek.

There were no wetlands! I want that to sink in so I'm saying it again. There were no wetlands on the Cottonwood Creek in 1875! Here is proof: Think of the land along the Cottonwood Creek that is now in the "wetland" classification. Picture in your minds the bottom land along the creek that is now swamp, the land that is now too wet to grow crops.

This is the land that was the first cropland. It was homesteaded first. It received the water first. The first ditches taken out of the creek delivered water to this land. On this land the pioneers built their first dugouts and log cabins and

stackyards. It was dry! It was cropland! It is now artificial wetland.

My grandfather built his dugout, then his log cabin, then his farmhouse at the bottom end of his farm--down near the creek bottom, near a fresh water spring. On the south was his garden and cropland. On the north was his orchard. East was his granary, corrals, and stackyard. Out front he planted shade trees. And off from the kitchen door he dug a cellar.

All this started in May, 1877, when he filed on his homestead. Things went along nicely until about 1944. That is a period of 67 years. In 1944, Uncle Frank was still living in the farmhouse, but he had to abandon the garden spot--it got too wet. He gradually stopped using the bottom of the farm for cropland--too wet. He could no longer use the cellar--too wet. In 1944 he sold the farm to my dad; I was 10 years old. We continued to use the stackyard but the trees in the orchard died out. I remember watching as my father and our hired man used two teams to pull out the last of the dead fruit trees. I took a drink from the spring and spit it out--too salty. I remember sitting under the shade trees while we ate our dinner.

Now it is 1992. The shade trees are dead--too much water. In the spring the cellar hole is a mud hole. In the fall the hole is level full of water. And where we stacked the hay, water now stands on the surface.

And now you, (expletive delete!), call it a wetland and have "pirated" a claim over it. I have the wetland act! This E.I.S. salinity project will further decay our private property rights.

Page IV-26 says that the irrigation companies will have to convert from a fixed delivery system to a demand delivery of irrigation water. In other words, we have to surrender our right to have our own delivery system and do it your way. Another private property right down the drain (pun intended).

The payment of \$10.91 per acre-foot of Colorado River depletion (page IV-24) is required by an undetermined entity. Agreeing to that is like signing a blank check. What is that payment and who is going to pay it?

How long is a farmer obligated to maintain his respective practice? The E.I.S. is ambiguous on this point. Is it 25 years or the life of the project, or both? To hold a farmer liable for 25 years is unreasonable. Under the present policy of the ASCS, a person is liable for 10 years for an underground pipe line, and 10 years for gated pipe. In your salinity project, this liability should not be more than 10 years.

Even if all the inconsistencies, fallacies, and ambiguities of the E.I.S. were fixed, there are still inherent barriers to the implementation of this project.

1) The government changes the rules. We have learned the hard way--from sad experience--that the government will change the rules at will. When things are not going to suit the powers that

1
be, they change the rules. And that's what we are in for if we sign up for this salinity project. We might think we have a contract, but out of the clear blue sky the government will change the rules. The farmer can't change the rules but the government can. Case in point: The Reclamation Reform Act. we thought we had a binding contract with the Bureau of Reclamation when we did the Joe's Valley (Emery County) project. Not so. The Reclamation Reform Act changed the rules, and that is exactly what will happen with this salinity project.

Under the present wording of the E.I.S., salt won't be reduced because wetland won't be reduced. As a result, the powers won't be satisfied, so they will change the rules. And when they change the rules, the noose around the farmers' necks will be pulled tighter.

2) If we sign this agreement, we are bound; but, the government is never bound because all it has to do is say, "There is no money."

I'll look forward to your response.

Sincerely,

Montell Seely
Post Office Box 934
Castle Dale, UT 84513

My name is Gale Jorgensen. I'm a member of the Cottonwood Irrigation Co. Board of Directors. I am also a rancher along with my brother, Ray Jorgensen.

While we support the idea of lessening the salinity in the San Rafael River drainage, we have great concerns about this project. One concern is that the prime site for mitigation of wetlands is along the Cottonwood Creek from the DWR farm just south and east of Castle Dale to the forks of the San Rafael which is private land and includes our main ranch located on the Cottonwood Creek southeast of Castle Dale. If the wetland area of our ranch is put into mitigation, it would destroy the whole sheep ranching operation. It would be impossible to have tightly controled wetlands and the sheep and cattle ranch together in the same area. We would then not only be losing the mitigation acreage but the whole ranching operation which includes the sheep, cattle, all other private grazing ground, forest service permits, BLM permits, and the other private farming land.

We are concerned because the EIS does not address the problem of downstream water rights in any way. We have no idea how the project would affect us because the water used on that ranch does not come out of the Cottonwood Canal system.

We do not think the proposal really addresses the main issue of the salinity problem in that there is not a

proposal to line any of the major canals. They are a major source of alkali.

We are concerned about the use of ponds for winter watering of livestock. The lines plug up with sediment and rodents (especially muskrats) dig holes in the lining of ponds.

The EIS does not define the floodplain area which is called for in the mitigation.

We suggest that the farmers have a greater input into the planning of this project than they have been afforded to this point. They are the ones that will be shouldering the problems and responsibilities along with some great financial obligations.

This project should not move forward until the many problems have been worked out with all parties. If this program is to reduce salinity, it should have as its main emphasis reducing salinity in the rivers rather than providing habitat for wildlife.

January 21, 1992

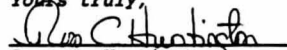
Soil Conservation Service
125 South State Street - Rm. 4012
Salt Lake City, Utah 84147

RE: Draft Statement No. DES 91-25 / Price - San Rafael River Unit
EIS

To whom it may concern:

The proposed plan calls for the Bureau of Reclamation to purchase some 380 acres of land together with water rights on Cottonwood Creek. This land to be then turned over to UDWR and used to mitigate the loss of wetland and wildlife habitat. What the plan fails to do is mention that three farm families would be eliminated and nine to ten Family operations would be significantly altered forever.

All proposed mitigation acres are located on Cottonwood Creek, one of five streams in the area. Less than 20% of the project is proposed on Cottonwood, yet 100% of the burden for wetland / wildlife mitigation. This seems grossly unfair and will not be acceptable. This proposal would eliminate those very people who are supposed to be helped by the project. Any project or part thereof must pro-rate any mitigated acres to be acceptable to local farmers and ranchers.

Yours truly,

Ross C. Huntington
Farmer
Box 195
Castle Dale, Utah 84513

When I first heard of the Colorado River Salinity Control Program that is being proposed for the Price - San Rafael Rivers, I assumed it to be an opportunity to help control the salinity in the Colorado river and at the same time up date and improve farming in Emery and Carbon Counties.

After studying the Draft Environmental Impact Statement I am convinced the way it is written it is not a salinity program but a plan to develop wildlife habitat and wetlands and increase the water that is set down stream to the Colorado river. There is very little concern for the landowners and water users of this area. There are on Cottonwood Creek less than half of dozen full time livestock men. The proposed mitigation in Chapter IV page 20, 1st paragraph for Off Farm Measures states, the preferred area for mitigation of fish and wildlife habitat is private land holding in the Cottonwood Creek flood plain extending from the creek's confluence with the San Rafael River upstream to Utah Dept. of Wildlife Resources existing land holdings near Castle Dale Ut. It states that this land would be purchased and ownership would be transferred to the State of Utah. This action would put out of business three full time livestock men. Of which I am one. This land is not for sale. It is already prime wildlife habitat and livestock grazing and always will be wither we have a salinity program or not. The main wildlife habitat in Carbon and Emery countries is private land because landowners are taking care of the land and are growing something allowing wildlife to exist along with livestock. If the Bureau of Reclamation and Utah Dept. of Wildlife Resources want to mitigate wildlife habitat they should go out on public land and develop vegetation that will enhance wildlife and livestock grazing.

The question of a need to mitigate wet lands from off farm measures is debatable. There is no plan to line major canals which are the primary source of wetlands along with the river bottom flood plains which will not change.

The question of Water Rights are not fully addressed. For example:

1. Downstream Water Rights have not been involved in the project.
2. The proposed off farm improvements does not cover Cottonwood Creek Irrigation Company's service area or its total decreed acreage.

The rating system described on page IV-24 paragraph 3 states. The first to receive on farm funding would be the applicant most willing to implement wetland and wildlife practices. These practices include establishing wetlands and wildlife habitat and fencing at a 70/30 cost share and

maintenance to keep livestock out. Any land owner found in violation of the contract could be asked to repay all cost shared monies.

Most of Utah is already public lands. Now we are being asked as private landowners to give portions of our lands to the public wildlife and maintain a fence around it to keep out our livestock. In return we receive a project that will cost a full subscriber \$30,000.00 that will benefit down stream users of the Colorado and the U.S. Government.

Benefits from this project are questionable because no one knows how long we can put salt on our lands without washing it off before production decreases.

If we in this area were cash crop producers this project as proposed may be more beneficial, but we are stockmen. We sell livestock. I can sell my cattle even if they get rained on

I own and operate about 1000 acres on the Cottonwood Creek. I crop about 200 acres of it but I irrigate about 500 acres of it and my cattle harvest it and everything else that grows. I have more fences than I can maintain now without maintaining another fence to keep them out of wildlife habitat.

The plan states on page I-7. Both Reclamation and SCS elicited local participation in planning, which they did. They asked our concerns We asked about lining canals and showed them where they leaked. They said not cost effective. We asked about storage in local reservoirs to accommodate a demand delivery system. They said it will be addressed, it is not. We asked about using saved water on additional acres. The question was ignored. We asked about down-stream water rights. They proposed giving our farms to the Department of Wildlife Resources. I could go on about other concerns like the forecast increase in O&M that would change my water bill from \$800.00 a year to more than \$7,500.00 a year and that is without a pumping charge.

We can not support this plan as written. I believe that the planning committee needs to involve the local land and water owners to come up with a plan that we can live with and afford.

Edgely J. Magnuson