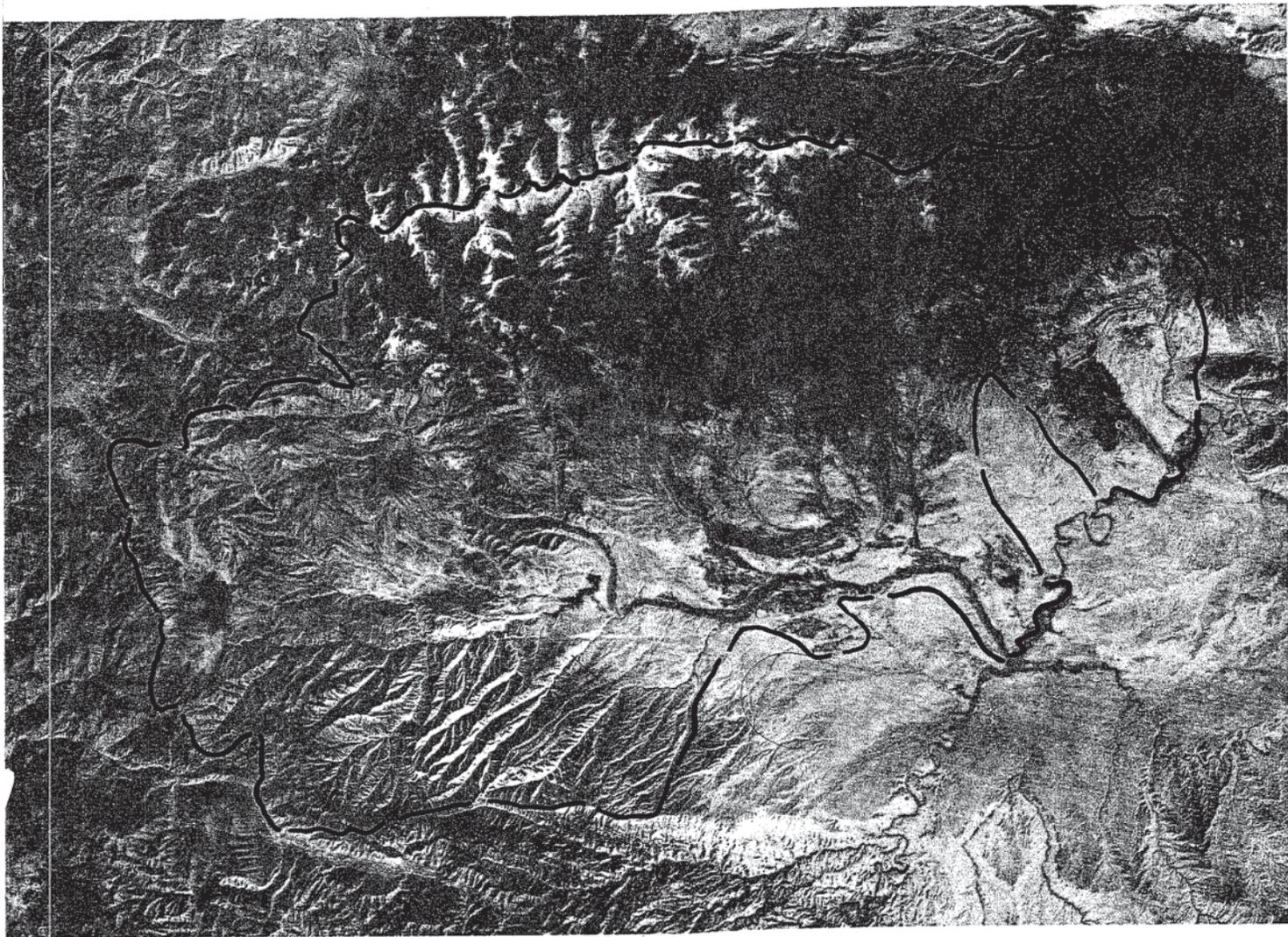


# U.S.D.A. Salinity Report

## Uintah Basin Unit, Utah



### Colorado River Basin Salinity Control Study

Prepared by

U.S. Department of Agriculture  
Soil Conservation Service

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USDA SALINITY REPORT  
FOR  
THE UINTAH BASIN UNIT  
COLORADO RIVER BASIN SALINITY CONTROL STUDY  
STATE OF UTAH

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In Cooperation with  
Forest Service  
and  
Science and Education Administration - Agricultural Research

Prepared under the Colorado River Basin Salinity  
Control Act, Public Law 93-320, Title II.

January 1979

## SUMMARY

The Uintah Basin Unit lies in the northeastern part of the State of Utah. It includes all of the Duchesne River, Ashley Creek, and Brush Creek drainages.

The Uintah Basin Unit is predominantly an agricultural area. Irrigation was introduced in the Basin in 1905. It has steadily increased since then. There has also been a steady increase in saline land areas and in salt concentration in the river systems. There have been very few irrigation improvements installed through the years.

The Basin has some unique mineral resources as well as oil and oil shale reserves. In recent years, there has been an increase in activity in development of these resources. This is expected to have an impact on the future economy of the Basin.

Public Law 93-320 and a Memorandum of Agreement give the Soil Conservation Service (SCS) the responsibility to study the effects of on-farm improvements on irrigation efficiencies and the salinity in the Colorado River. Under the same authorities, the United States Bureau of Reclamation (USBR) is studying off-farm conveyance system improvements and their effects on salinity in the Colorado River. USBR will present a combined report of on-farm and off-farm systems and their impacts.

To make the on-farm study, SCS gathered available basic data from the United States Geologic Survey, USBR, River Commissioner, Utah State Division of Water Resources, and Bureau of Indian Affairs. SCS conducted special studies to obtain other necessary data. These included interviewing farmers on present conditions and needed irrigation improvements, sampling water quality of underground drains, studying erosion and salt production from nonirrigated lands, and compiling data on the soils and geology of the Basin.

From this basic data, several on-farm alternatives were developed. These were analyzed and the results presented to local irrigation company officials who indicated their preferences of the alternatives in a series of meetings.

During these meetings, a plan was selected from a combination of the alternatives. This plan calls for on-farm improvements to be installed on 84 percent of the land that is potentially treatable. This will result in a projected decrease in salinity of 12.4 milligrams per liter at Imperial Dam on the Colorado River. This plan also benefits the Basin in the form of increased net returns to the farmers. No range or forest land will be treated under the selected plan. No unique cultural, historical, archeological, or natural resources will be disturbed by the installation of project measures. Significant impacts on local wildlife, wetland, and upland game habitat are expected.

Implementation of the selected plan will cost \$52.4 million for construction. It will require a 75 percent federal cost-share to assure implementation. This cost includes all components of the irrigation systems plus wildlife enhancement facilities where necessary. Landowners will furnish the remaining 25 percent of construction cost plus annual operation, maintenance, and replacement costs. Noncost-shared management practices will be required as a condition for cost-share assistance for other practices where such management practices are necessary to achieve project objectives. An increase in SCS staff for technical support will be required.

Monitoring of the water management systems and all related resources affected by the improvements will be continued by appropriate agencies and expanded in selected areas to more accurately measure effects of installation of this plan.

The following table shows a summary of significant effects for the alternatives presented in this report.

UNTAAH BASIN SALINITY STUDY  
SUMMARY OF SIGNIFICANT EFFECTS

Item	Unit	Alternative		
		Future without a project	Farmer Identified Irrigation Improvements	Potential Irrigation Improvements Selected Plan
Total Installation Cost	\$1,000	9,601	55,330	61,039
Net Benefits (avg. annual)	\$1,000	1,951	3,513	4,716
Salt Reduction	Tons	21,000	82,900	98,900
Salt Reduction	mg/l	3.4	11.7	15.0
Wetland Habitat Lost <sup>1/</sup>	Acres	5,290	18,180	22,470
On-farm Irrigation Improvements	Acres	23,000	128,300	144,700
Energy Requirements	MWh	5.2	19.5	31.2
				52,389
				3,682
				76,600
				12.4
				19,860
				122,200
				22.6

<sup>1/</sup> Converts to Upland Habitat

## INTRODUCTION

### Authority for Study

The Colorado River Basin Salinity Control Act (Public Law 93-320) provides authority for the United States Department of Agriculture (USDA) to participate in Colorado River Basin Salinity control investigations along with the United States Department of the Interior (USDI) and the Environmental Protection Agency (EPA) in the states of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. Title II (Section 203) directs the Secretary of the Interior "to cooperate with the Secretary of Agriculture in carrying out research and demonstration projects and in implementing on-the-farm improvements and farm management practices and programs which will further the objectives" of the Salinity Control Program upstream of Imperial Dam on the Colorado River.

The Uintah Basin Unit is one of the Irrigation Source Units being studied under the provisions of Title II (Section 203). In this report, USDA presents alternative plans for improvement of on-farm irrigation efficiency and the expected effects these improvements will have on salinity. USDA also presents a plan for implementing the improvements. The United States Bureau of Reclamation (USBR) is studying the off-farm conveyance systems and will present a combined report of on-farm and off-farm improvements and effects.

A Memorandum of Agreement, effective March 27, 1975, was entered into between the USBR and the Soil Conservation Service (SCS) to implement the specific cooperative activities called for under Title II of the Colorado River Basin Salinity Control Act. Under this Memorandum of Agreement, USBR agrees to:

1. Establish and develop cooperative Irrigation Management Services (IMS) programs.
2. Provide data and information relating to the development of designs for improvement of irrigation distribution systems to insure that on-farm systems designed by the SCS can be successfully integrated into the distribution system.
3. Continue to cooperate in sponsoring appropriate research, extension, and education programs.
4. Participate in the formation and activities of local salinity control coordinating entities.
5. Coordinate investigations in the diffuse source units with appropriate agencies to formulate and implement salinity control plans.

Soil Conservation Service activities are authorized under PL 83-566 (Section 6) with added authority under PL 93-320, Section 203 (a)(1) and

(b)(1). Under this Memorandum of Agreement between USBR and SCS, SCS agrees to:

1. Support the IMS program by coordinating technical assistance to water users on water management measures as provided through ongoing programs with soil and water conservation districts and by providing soil survey data.
2. Make investigations and develop plans for feasible alternatives for implementation of on-farm programs for the improvement of irrigation efficiencies. Such alternative plans will be supplied to USBR so that their plan describes the total overall improvements contemplated for the area.
3. Arrange for Science and Education Administration - Agricultural Research (SEA-AR) or other appropriate USDA agencies to establish and conduct research and demonstration projects to advance the technology available for designing on-farm systems for increasing irrigation efficiencies and controlling salinity from diffuse sources.
4. Participate in the formation and activities of local salinity control coordinating entities and conduct educational programs through the Cooperative Extension Service.
5. Appraise the salinity accretion emanating from within the diffuse source areas located on private lands and in cooperation with the Forest Service (FS) on National Forest lands and participate in the development of coordinated programs for these lands and the adjoining or included National Resource lands in cooperation with appropriate agencies of the USDI.
6. In cooperation with research and operational entities concerned with water quality conditions, undertake a comprehensive evaluation of agricultural water use and erosion as they relate to salinity control within the Colorado River Basin and report thereon.

The Ute Indian Tribal Council, in a letter dated April 28, 1978, authorized the SCS to include the Indian lands in the study.

#### Objectives and Scope

There are two main objectives of the USDA's participation in the Salinity Control Studies. First is to determine the present contribution of salinity from irrigated cropland and related upland watershed areas. Second is to determine the reduction in downstream salinity that can be obtained by effectively improving on-farm irrigation efficiencies and reducing erosion and sediment delivery from irrigated and upland areas. This study corresponds to the primary objective of salinity control as set forth in the Colorado River Basin Salinity Control Act (Public Law 93-320).

Accomplishment of salinity control contributes to (a) economic development by increasing the efficiency of agricultural production and reducing downstream salinity damages, and (b) to environmental quality by reducing the salt load to the Colorado River and giving consideration to fish and wildlife resources.

The significant effects of the alternative plans are displayed in three accounts. These include Economic Development, Environmental Quality, and Social Well-Being. These follow the standards set forth in Principles and Standards for Planning Water Resources for systematically displaying beneficial and adverse effects. The degree to which plan displays are developed corresponds to the degree needed by the USBR in their overall report on the Uintah Basin Unit.

#### Coordination With Other Agencies

Coordination of USDA activities with local, state and other federal agencies was accomplished through the SCS Salinity Study Team. This interdisciplinary team consisted of members from the River Basin and Watershed Planning staff and State Resource Conservationist's staff, Salt Lake City; Area II staff, Orem; Roosevelt Field Office; and Vernal Field Office. Other USDA agencies include SEA-AR, FS, and the Cooperative Extension Service.

Overall coordination was accomplished through the Multi-Objective Planning (MOP) technical team for the Uintah Basin unit, Colorado River Water Quality Improvement Program. This MOP team was organized by the USBR. Other members include: SCS; Fish and Wildlife Service (F&WS); Bureau of Land Management (BLM); Bureau of Indian Affairs (BIA); Ute Indian Tribe; Uintah Basin Association of Governments; Utah Division of Health; and Utah Division of Water Resources.

The USBR is studying off-farm conveyance systems. They will use this report in their combined report of on-farm and off-farm improvements and effects. They are planning conveyance systems compatible with the selected on-farm improvements. Coordination will be required during construction to install on-farm and off-farm systems in a proper sequence.

The Uintah Basin Soil Conservation District (SCD) sent letters to over 300 randomly selected landowners encouraging them to cooperate with SCS technicians in gathering data for the study. During the course of the study, several public meetings were held to inform those interested of study progress. The SCD conducted information meetings at Duchesne, Roosevelt and Vernal to initiate the USDA study on January 27, 1976. The Salinity Study team conducted public meetings at Vernal and Roosevelt on May 3 and June 9, 1977. These meetings were for the purpose of soliciting comments and suggestions for on-farm improvements in each of the evaluation units. A series of five meetings were also held with water users and irrigation company officials during November 29 through December 1, 1977, to review the alternative plans. Recommendations from these public meetings helped select the implementation plan presented in this report.

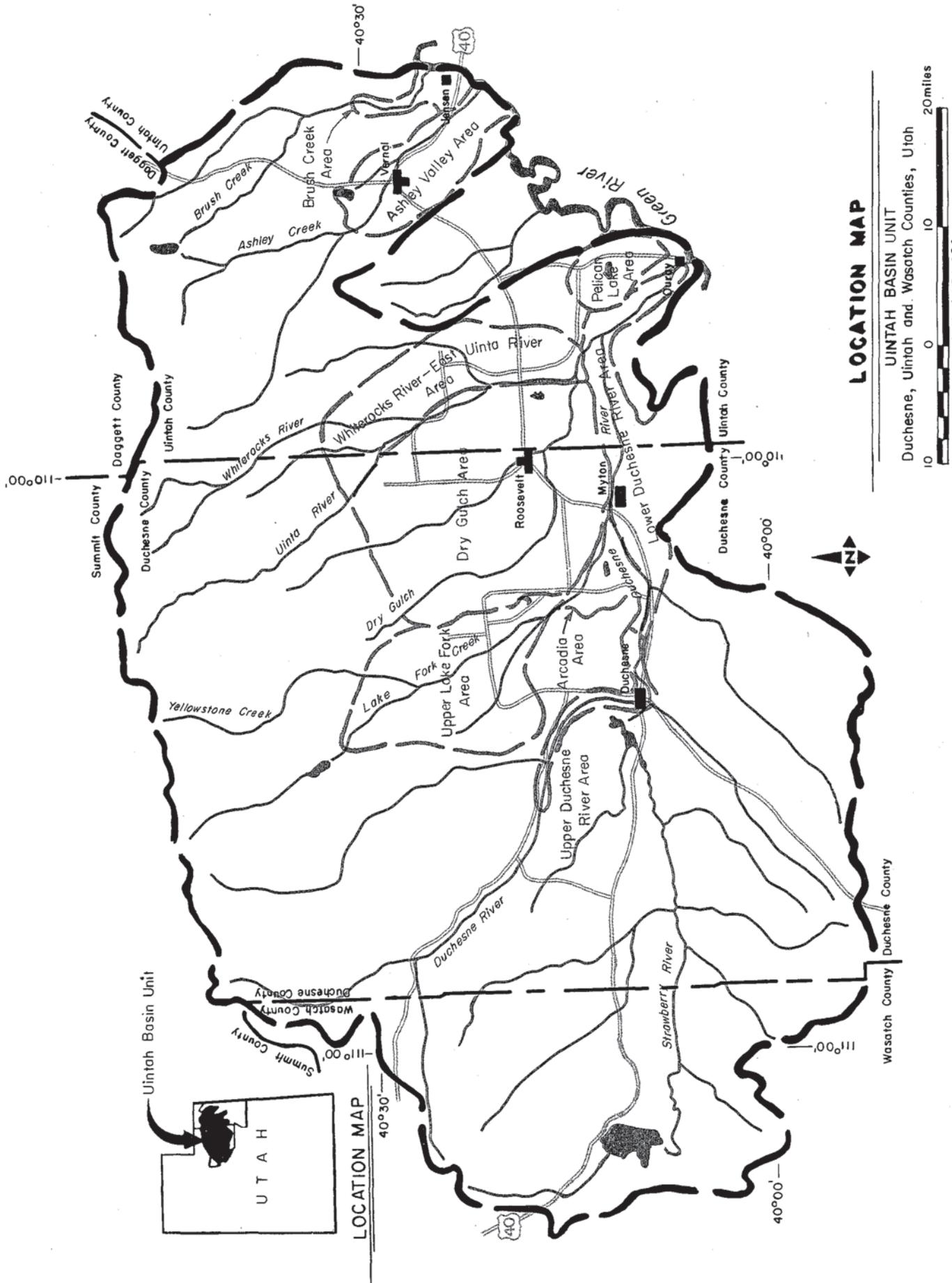


Figure 1