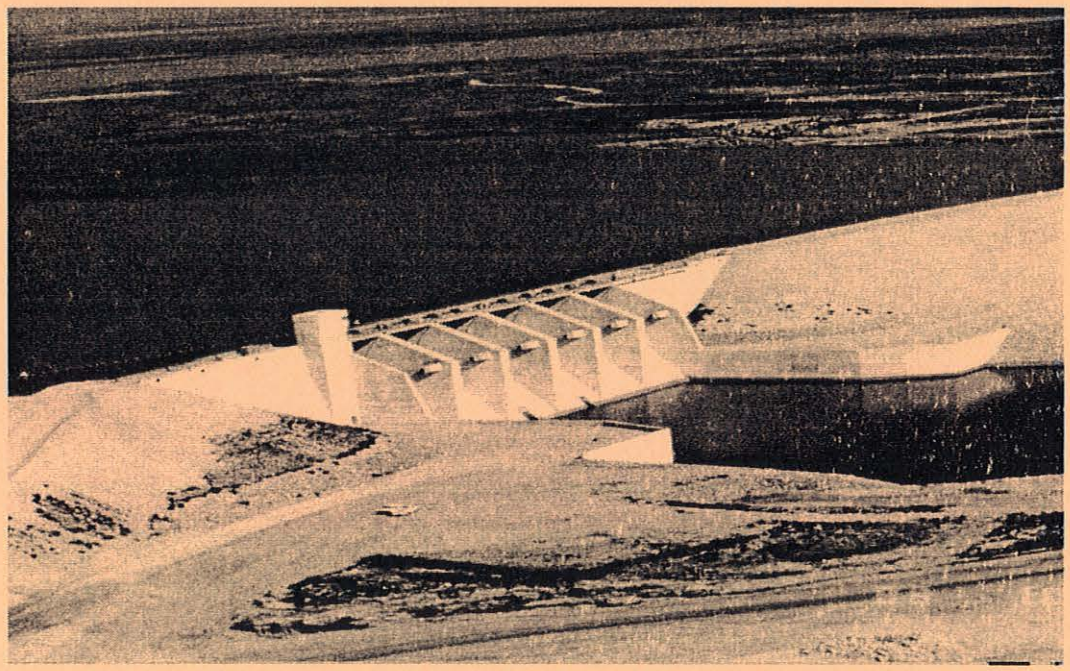
1999 Calendar Year Report to the

Pecos River Commission

NEW MEXICO	*TEXAS*
Colin McMillan	*Julian Thrasher, Jr.*

FEDERAL CHAIRMAN
Hector Villa



UNITED STATES DEPARTMENT of the INTERIOR
BUREAU of RECLAMATION

Upper Colorado Region
Albuquerque Area Office
March 27, 1999

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INTRODUCTION

The Albuquerque Area Office of the Bureau of Reclamation (Reclamation) is responsible for operation, maintenance, and/or oversight of four projects on the Pecos River (Figure 1). These projects are: the *Carlsbad Project*, which includes Sumner, Brantley, and Avalon Dams; the *Pecos River Basin Water Salvage Project*; the *Fort Sumner Project*; and the *Malaga Bend Salinity Alleviation Project*.

Reclamation's Carlsbad Field Office continues to report to the Albuquerque Area Office's Water Resource Management Division. An agreement between Reclamation and Carlsbad Irrigation District (CID), finalized on October 2, 1989, provided for CID to operate and maintain Brantley and Sumner Dams, and the Pecos River Water Salvage Project. This contract was implemented during 1990 and has continued during 1999. Reclamation continues to be responsible for assuring that this work is accomplished in compliance with all applicable agreements, contracts, regulations, compacts, and other related laws.

CARLSBAD PROJECT

Crop Production

As of the printing of this report, the Carlsbad Irrigation District had not submitted the 1999 crop census report.

Reservoir Storage Entitlements

All Carlsbad Project reservoirs (Figure 2) were operated in accordance with the requirements of the Pecos River Compact and Flood Control Criteria of the Corps of Engineers.

The Corps of Engineers determines area and capacity tables for Santa Rosa Reservoir. Reclamation calculates annual total conservation storage entitlements for the Pecos River reservoirs that are in New Mexico. Table 1 presents the calender year 2000 storage entitlements for the four Pecos River Reservoirs.

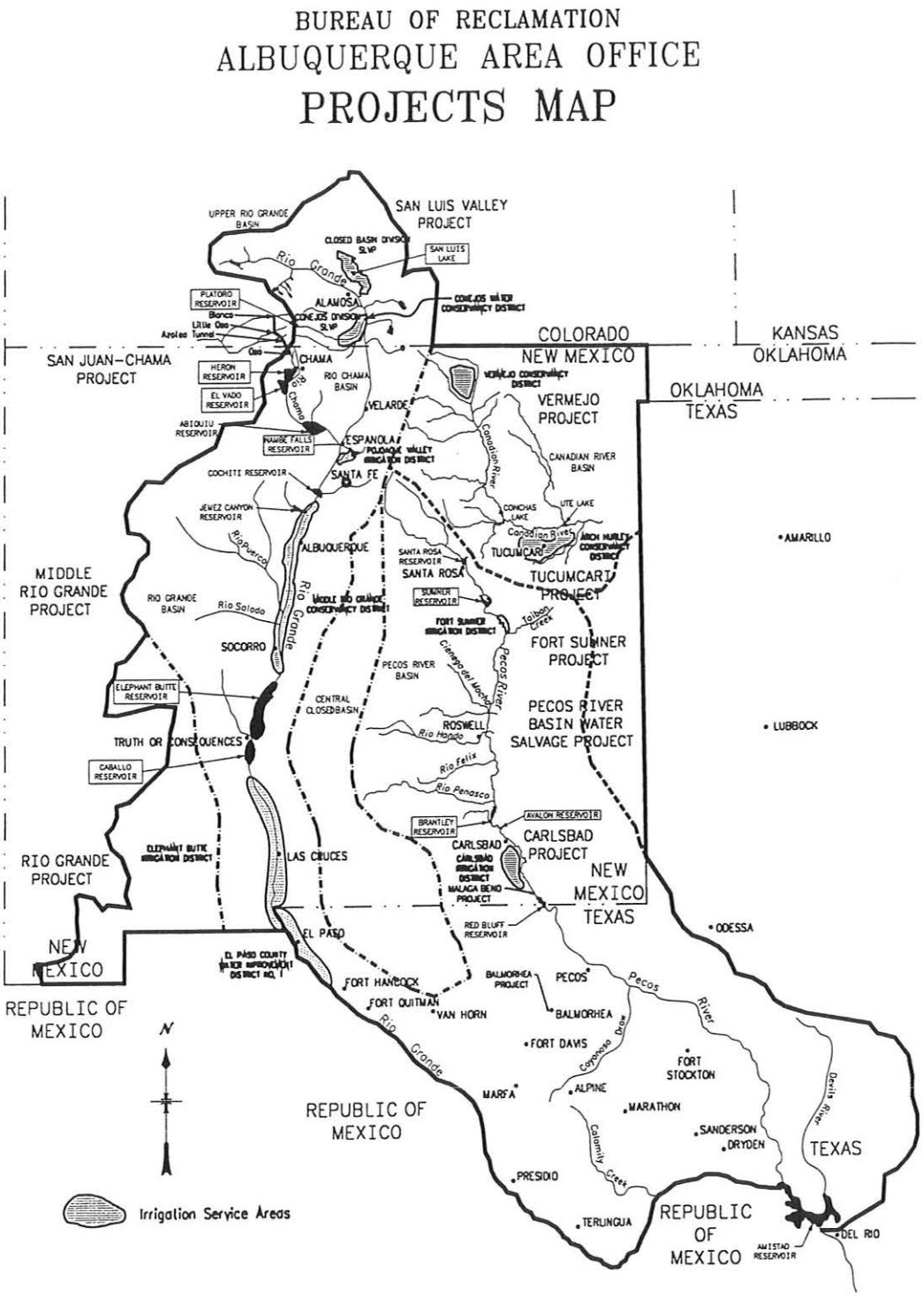

Figure 1. Project map of the Reclamation's Albuquerque Area Office.

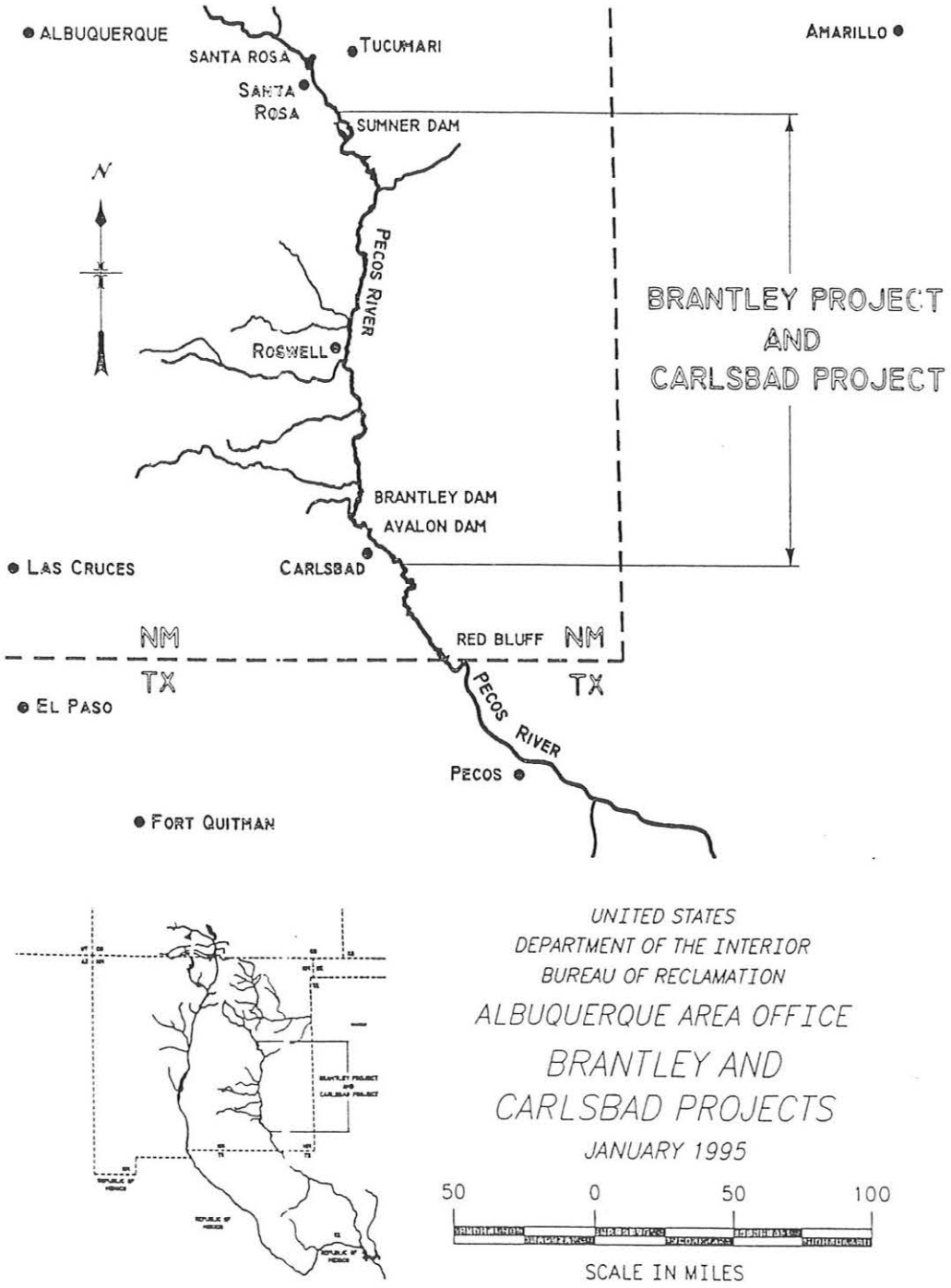

Figure 2. Area map of the Carlsbad Project.

Table 1. Year 2000 annual total conservation entitlement storage for the Carlsbad Irrigation District.

Reservoir	Entitlement Storage (at)	Minimum Pool (at)	Estimated Sediment Accumulation Since Last Survey (at)	Total Storage (at)	Conservation Elevation (ft)
Santa Rosa	97,633	0	1,767	99,400	4,745.63
Sumner	35,001	2,500	6,267	43,768	4,261.00
Brantley	40,000	2,000	11,862	53,862	3,257.24
Avalon	3,866	600	0	4,466	3,117.40
TOTAL:	176,500				

Sumner Dam

On December 17, 1998, Reclamation assumed the operations of Sumner Dam from the CID, which had been operating the dam under the terms of the October 2, 1989 agreement. Reclamation's assumed operations provide that the CID dam tender make gate adjustments only as directed by Reclamation. This assumption of operations was related to non-irrigation season water operations required for compliance with the Endangered Species Act. The assumption of operations was extended into the irrigation season water operations. Reclamation continues to direct the CID dam tender for all gate adjustments and the CID continues to be responsible for all maintenance activities. This operating procedure does not alter the normal operations of Santa Rosa and Brantley Reservoirs for the purpose of delivering water to CID.

Sumner Reservoir began the year with a total storage of 19,576 acre-feet (af) and an elevation of 4250.08 feet (ft). This was also the minimum storage for the year. The maximum total storage occurred on August 14, 1999 with 43,938 af and an elevation of 4261.06 ft. Sumner Reservoir ended the year with a total storage of 32,262 af, and an elevation of 4256.53 ft. Sumner Reservoir exceeded the maximum 1999 conservation storage of 43,768 af (pool elevation of 4261.00 ft) on August 14 and 15 with conservation storages of 43,940 and 43,820 af, respectively. The outflows from Sumner Dam were increases to the inflow rate to reduce the conservation storage. Figure 3 illustrates the 1999 total storage conditions for Sumner Reservoir.

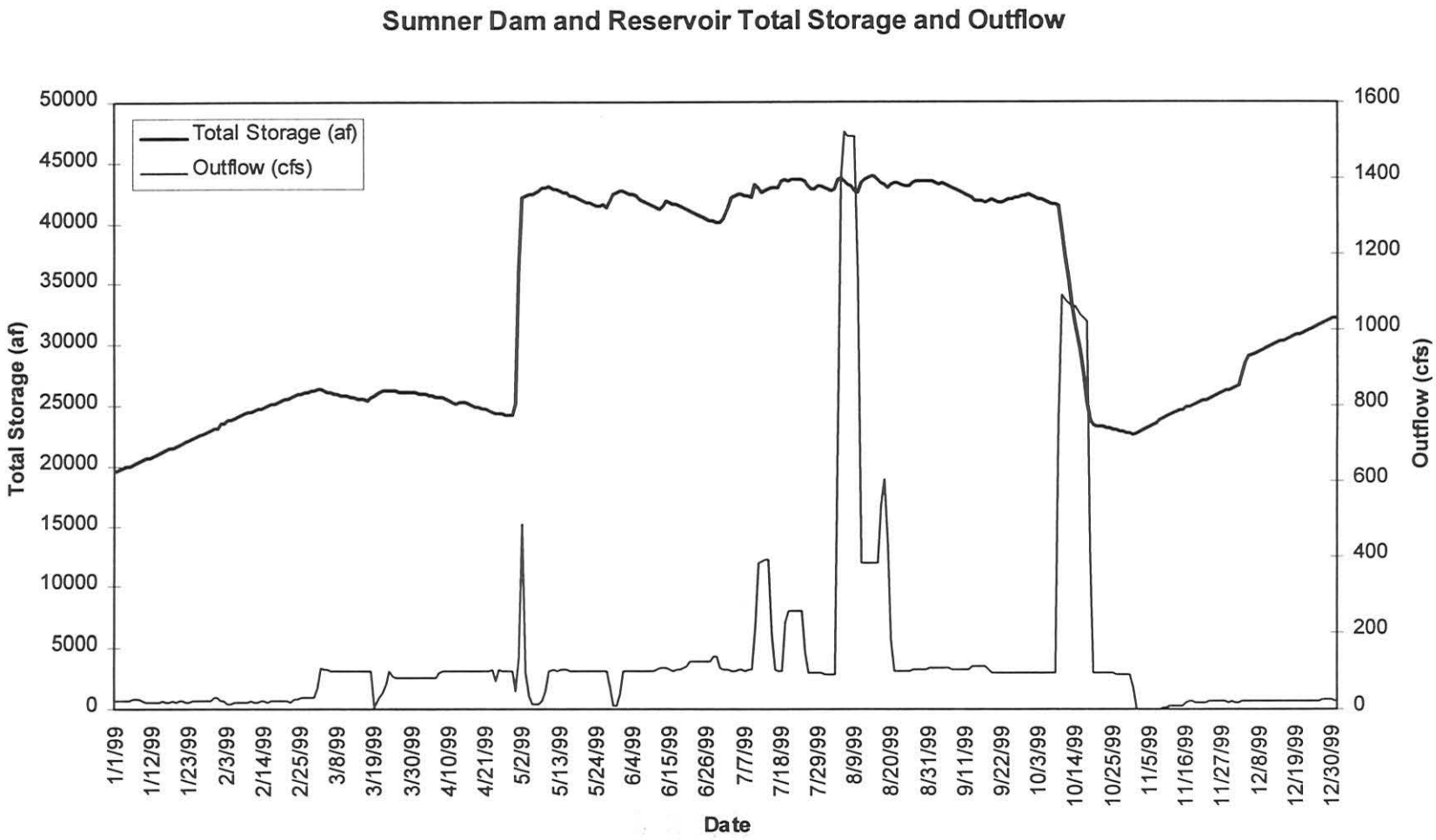

Figure 3. Sumner Dam and Reservoir year 2000 total storage volumes and outflows.

Heavy summer rains and entitlement storage restrictions required CID to move water from Sumner Reservoir to Brantley Reservoir throughout the summer. Between May 1 and May 4, July 10 and July 26, and August 4 and August 20, 1,244, 4,896, and 2,433 af of water, respectively, was transported to Brantley Reservoir. The year's first irrigation block release for CID, excluding water for Fort Sumner Irrigation District, occurred between October 9 and October 17, totaling 16,703 af. The total water volume moved for CID from Sumner to Brantley was 25,276 af. A maximum mean daily release of 1,520 cubic feet per second (cfs) occurred on August 6 (as reported by the USGS for the Pecos River below Sumner Dam gage). Figure 3 also illustrates the 1999 Sumner Dam releases/bypasses. A maximum inflow to Sumner Reservoir of 2,180 cfs occurred on April 30 (as reported by the USGS for the Pecos River near Puerto de Luna gage).

Additionally, from November 19, 1998 through Feb 14, 2000, the partial bypass of inflows to Sumner Reservoir occurred to provide flows through critical habitat areas of the Pecos bluntnose shiner. Between November 19, 1998 and February 28, 1999 (non-irrigation winter operations), 3,967 af of water were bypassed. During irrigation season operations (March 1, 1999 through October 31, 1999) water was intermittently bypassed in March, May, and July through September, totaling 998 af. During the winter operations between November 1, 1999 and February 29, 2000, a total of 4,359 af of water were bypassed. These bypasses resulted in additional net depletions to CID of approximately 1320, 330, and 1220 af of water for the 1998-1999 winter operations, 1999 irrigation operations, and 1999-2000 winter operations, respectively. The 1999-2000 winter operations value is only an estimate (USGS data for February 2000 was not complete). The net depletions were calculated utilizing the Pecos River RiverWare Model discussed in the **Pecos River Model Development** section. Reclamation proposes to offset these net depletions (see the **Endangered Species Program for Water Operations** and **Reclamation's Water Offset Program** sections).

Under a water right permit granted by the State of New Mexico, CID is allowed to store up to an additional 20,000 af in Sumner Reservoir from November 1 to April 30 each year, provided that the conservation storage of all four reservoirs on the Pecos River in New Mexico does not exceed 176,500 af. No additional storage under this water right permit occurred in 1999.

Brantley Dam and Reservoir

Brantley Reservoir began the year with a total storage of 34,871 af at an elevation of 3251.15 ft. A maximum storage of 41,302 af (pool elevation of 3253.51 ft) and a minimum storage of 18,086 af (pool elevation 3243.18 ft) occurred on March 28 and 30, and October 13, respectively. Brantley Reservoir ended the year with a storage of 26,853 af (pool elevation of 3247.75 ft). Brantley Reservoir did not exceed its conservation storage

of 52,793 af (pool elevation of 3256.98 ft) in 1999. Figure 4 illustrates the 1999 total storage conditions for Brantley Reservoir.

The maximum release of 783 cfs occurred on October 15 during the second compact delivery to Texas pursuant to the New Mexico Interstate Stream Commission's (NMISC) water lease program with CID. Throughout the year, releases varied depending upon irrigation demand. Releases from Brantley Dam met the required mitigation release of 20 cfs for fishery flows between Brantley and Avalon except in November and December. During these months Avalon Reservoir was drained for maintenance work and the releases from Brantley were curtailed to accommodate these activities. For these two months approximately 20 cfs were released for every seventh day to provide water through the river reach between Brantley and Avalon Reservoirs. Figure 4 also illustrates the 1999 releases from Brantley Dam.

Avalon Dam

Avalon Dam is used to provide hydraulic head for diversion into the Carlsbad Main Canal. The reservoir began the year with a total storage of 2,420 af (pool elevation 3174.90 ft). The reservoir was drained in October extending through December, to perform maintenance on the drum gates. Diversions into the Carlsbad Main Canal began on March 22 and continued through October 31. A maximum diversion into the canal of 422 cfs occurred on July 9. The CID diverted a total of 97,760 af into the Carlsbad Main Canal during 1999.

From July 15 through July 26, 8,009 af of water was released to the Pecos River for delivery to the State of Texas for Pecos River Compact purposes as part of the NMISC's lease agreement program with CID. A second block release of approximately 7,690 af took place between October 15 and October 24. The total release to Texas for 1999, including the two block releases and water released to drain Avalon Dam for maintenance work, was 17,050 af. A peak release to the river of 459 cfs occurred on October 17.

Carlsbad Irrigation District Proposed Title Transfer

On January 21, a 1999 revised title transfer legislation (S.291) was introduced to the U.S. Senate. As did past bills, S.291 provided for the transfer of certain lands acquired by the U.S. Government in 1905 for the benefit of the Carlsbad Project, and the irrigation distribution system, to CID. The Administration went on record supporting this legislation. Subsequently, HR.1019 was introduced, which deviated from S.291. No further action has been taken on either the Senate or House bills.

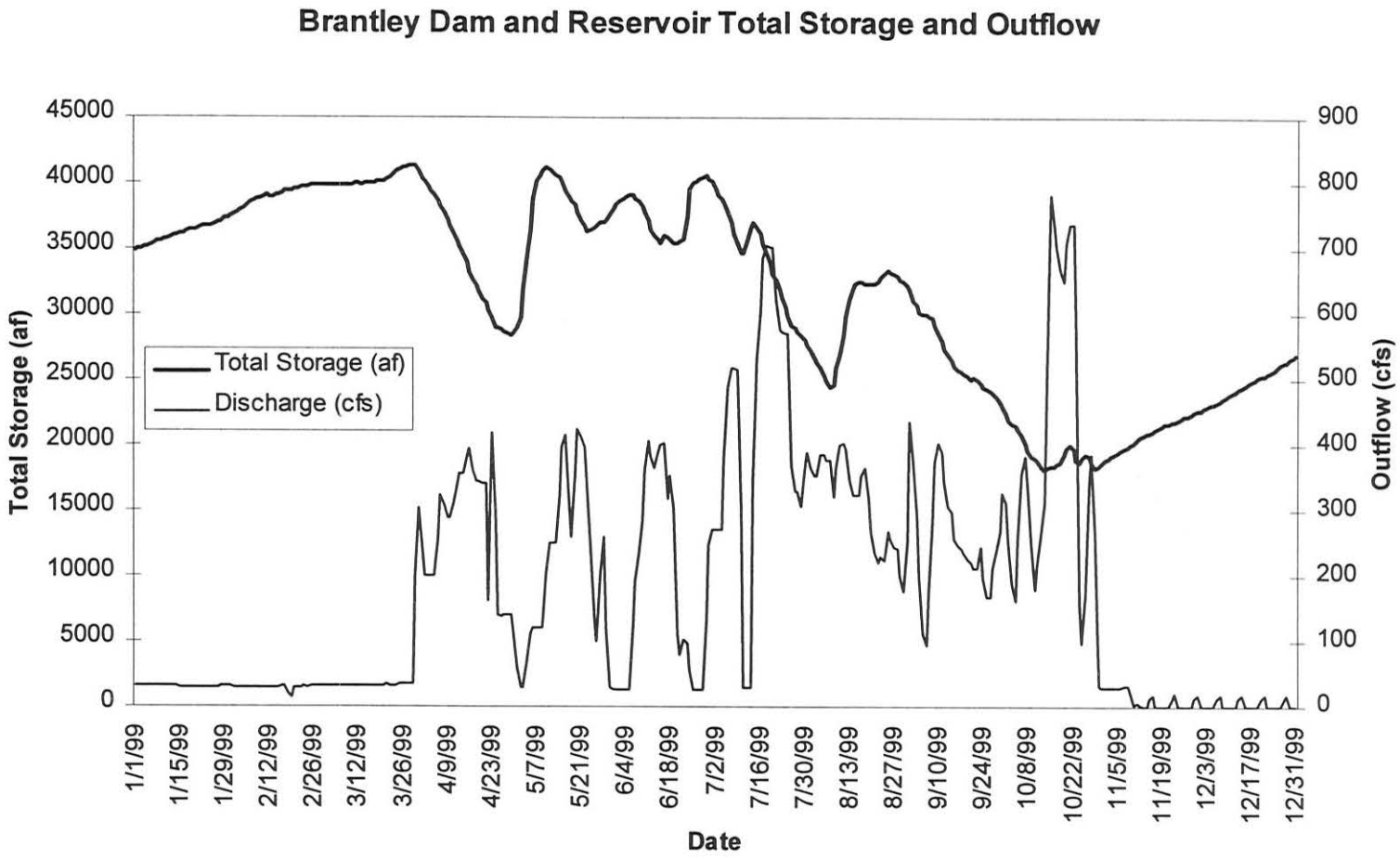

Figure 4. Brantley Dam and Reservoir year 2000 total storage volumes and outflows.

FORT SUMNER PROJECT

Crop Production

As reported by Fort Sumner Irrigation District (FSID), the crops grown in 1999 were forage (alfalfa hay, other hay, pasture, and silage), cereals (sorghum and wheat), vegetables (cantaloupe, watermelon, and peppers) and nursery stock. Out of a total irrigable area of 6,500 acres, 5,218 acres were irrigated in 1999. Total gross crop value was $859,645.

The average crop value per irrigated acre is $164.75. Of the total water diverted, 30,274 ac-ft was delivered to farms for a total of 5.80 ac-ft delivered per irrigated acre.

Operations

The irrigation season for FSID typically begins March 1 and ends October 31. FSID is also allowed to divert for a two-week period during the winter, which is usually just prior to the March 1 irrigation season. During irrigation season, 80 to 100 cfs is usually released from Sumner Reservoir depending on demand or their available water right.

FSID began diverting on March 3, 1999. A total of 43,250 af was diverted during 1999 from the Pecos River by FSID, as measured at the Fort Sumner Main Canal recorded by the USGS and provided by the FSID. No diversions were made into the FSID Main Canal from March 18 through March 22, April 30 through May 9, May 28 through May 31, and August 4 through August 8. Other than these 24 days, FSID diverted from a minimum of 61 cfs to a maximum 100 cfs. Diversions ceased on October 31.

ENVIRONMENTAL COMPLIANCE ACTIVITIES

Endangered Species Program for Water Operations

During 1999, coordination continued among Memorandum of Understanding (MOU) signatories (Reclamation, CID, U.S. Fish and Wildlife Service (FWS), New Mexico Office of the State Engineer (OSE), and New Mexico Department of Fish and Game (NMDGF)) to wrap up research efforts, develop the flow model, and share findings. The signatories to the Pecos River Memorandum of Understanding (MOU) are currently working to revise the present MOU so that this group remains active throughout the National Environmental Policy Act (NEPA) process (see the **National Environmental Policy Act Activities for Water Operations** section). Major changes expected in the next revision will be that the New Mexico Office of the State Engineer will no longer be a signatory to the MOU and the NMISC will be added as the newest signatory to the MOU.

Water operations during the year included bypassing a portion of Sumner Lake inflows as needed to target an average flow of 35 cfs at the near Acme gage and modifying block releases to the Carlsbad Irrigation District. Block irrigation releases from Sumner Reservoir did not last longer than 15 days and were timed to avoid a portion of the Pecos bluntnose shiner peak summer spawning period.

Reclamation has entered into agreements with the NMISC making available to Reclamation the lease of sufficient water rights from the NMISC's *Water Resource Conservation Program: Pecos River Portion* to offset additional net depletions caused by modified operations that potentially could not be offset through Reclamation's other programs.

Monitoring of the Pecos bluntnose shiner continued during 1999. Currently, the Pecos bluntnose shiner population appears to be "stable". Researchers indicate that winter base flow supplementation has yielded a great benefit to sustaining the population.

National Environmental Policy Act Activities for Water Operations

During 1999, Reclamation determined that it would be appropriate to prepare a Programmatic Environmental Impact Statement (EIS) for Pecos River Water Operations instead of an Environmental Assessment. An EIS addresses impacts of major federal actions and the process includes substantial public and stakeholder involvement. Reclamation proposes to modify Sumner Dam operations to protect the Pecos bluntnose shiner while minimizing economic effects. Operational alternatives include providing some minimum level of river flow and restricting the timing, duration, frequency, magnitude and rate of change of irrigation releases. A water options offset program will address how any new net depletions will be mitigated. The EIS Team and Working Groups are comprised of representatives from Reclamation, the NMISC and seven agencies serving as cooperating agencies: CID, Pecos Valley Artesian Conservancy District, FWS, U.S. Army Corps of Engineers, NMDGF, Chaves County and Eddy County. As the result of Reclamation's February 10, 2000 invitation, the NMISC will be a joint lead agency for the EIS, working with Reclamation to address Pecos Basin water management activities.

National Environmental Policy Act Activities for Resource Management Plan

During 1999, management alternatives were identified for an Environmental Assessment (EA) of the Brantley and Avalon Reservoirs Resource Management Plan (RMP). After a series of Planning Work Group meetings and a public meeting, Bio/West, Inc., the RMP Contractor, has initiated the EA development. With the final selection of a preferred management alternative, an RMP will be prepared to serve as a long-range guide to the

management of land-based resources on Reclamation lands around Brantley and Avalon. The EA and RMP are scheduled for completion by the end of calender year 2000.

OTHER PECOS RIVER ACTIVITIES AND OPERATIONS

Carlsbad Irrigation District Water Lease Program

Reclamation and CID entered into a 5-year agreement on February 9, 1999 which authorizes the conversion of Carlsbad Project water from irrigation to miscellaneous purposes and uses other than irrigation. This agreement is an umbrella contract which allows individual yearly contracts with the New Mexico Interstate Stream Commission. The three-party agreement with CID, Reclamation and ISC for 1999 was entered into on April 2, 1999. The NMISC leased 13,075 af in 1999 which was delivered to the Texas state line.

In March 2000, a second three-party agreement for the year 2000 water lease program was entered into.

Reclamation's Water Offset Program

Reclamation proposes to offset any additional net depletions caused by modified Sumner Dam operation for the benefit of endangered species through a water offset program. Modified operations caused an additional net depletion from the Pecos River of approximately 1,650 af during the period November 1, 1998 through February 29, 2000. Reclamation has taken actions to offset this depletion. Reclamation received a NM Office of the State Engineer permit to pump Brantley Project mitigation water to the Pecos River and to Brantley Reservoir. Under that temporary permit, Brantley storage was increased by 1,252 af after conveyance losses. During 1999, agreements were also reached with two Pecos River pumpers allowing Reclamation to lease a total of 990 af. Based on crop consumptive use and the conveyance losses, Brantley storage was increased by 624 af. The 1999 total of water offset actions was 1,876 af at Brantley Reservoir.

Reclamation and ISC are currently commencing an EIS on Pecos water management activities. Options for water offset will be analyzed during the environmental process.

Pecos River Basin Water Salvage Project

Under the authority of Public Law 88-594, Reclamation continues to control saltcedar growth from the Sumner Dam area to the New Mexico-Texas state line (Figure 5). This excludes the area between the Artesia bridge and north boundary of Reclamation's

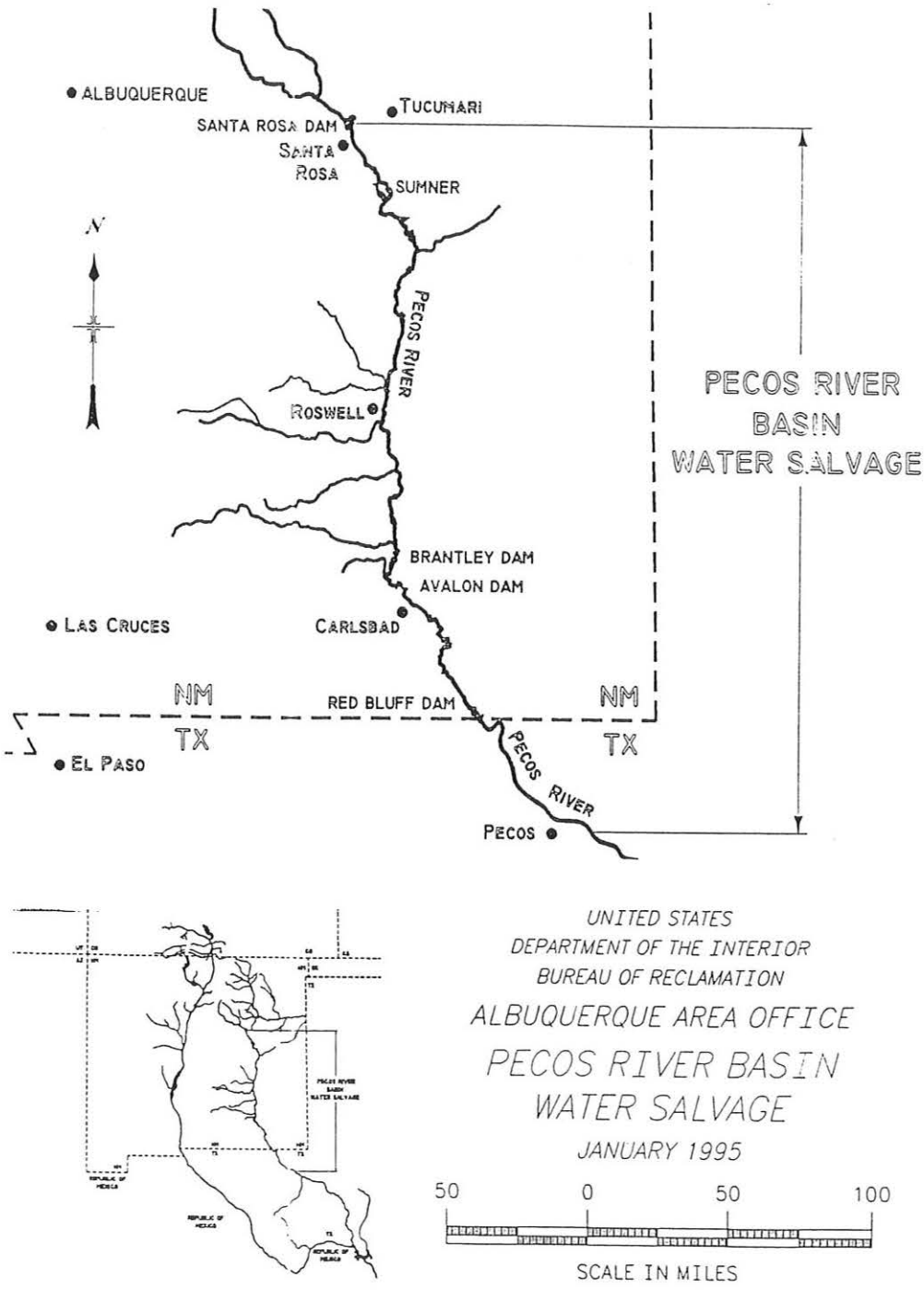

Figure 5. Area map of the Pecos River Basin Water Salvage Project.

Brantley lands. Reclamation contracts with the CID to perform the mechanical removal work. Since very few large old-growth saltcedar trees remain, saltcedar removal is primarily accomplished utilizing rubber-tire tractors with root plows.

The NMISC continues to support the Pecos River Basin Water Salvage Program by funding Reclamation's program to obtain easements from private land owners. This support is accomplished through cooperative agency agreements which are renewed annually.

Pecos River Model Development

Development of a water operations model for the Pecos River continued in 1999. Reclamation is using the RiverWare software developed in a joint effort between Reclamation, the Tennessee Valley Authority (TVA), and the Center for Advanced Decision Support for Water and Environmental Systems (CADSWES). CADSWES is based at the University of Colorado at Boulder. Development of the RiverWare model for the Pecos River is on-going. During 1999, efforts continued for development of the daily time step model that includes methods for simulating channel conveyance losses and reservoir evaporation. Channel conveyance losses are computed in relation to season and flow, and flow routing is performed using the Muskingum-Cunge routing method. Reclamation has continued to contract Tetra Tech, Inc. (formerly FLO Engineering), a private consulting firm, to assist Reclamation with the model development. During 1999, Tetra Tech coordinated with NMISC to address the concerns that NMISC has with the model development. This coordination is on-going. During 1999, methods were added to the model to simulate a streambank storage and return effect along the Pecos River and seepage from Avalon Reservoir. Also, many enhancements were made to the calibration of loss coefficients based on comments received from NMISC.

The Pecos River system was developed in the model for Santa Rosa Lake to Avalon Dam. The model consists of ten reaches including eight reaches between Sumner Dam and Brantley Reservoir. Diversions by the Fort Sumner Irrigation District, the Carlsbad Irrigation District, and river pumpers are simulated in the model. Return flows from FSID are also computed. Extensive work has been completed to calibrate the reservoir objects. This included an analysis of the cumulative effects of Major Johnson Springs water, seepage, and bank storage at Brantley Reservoir.

The model will be used to analyze the effects of potential alternatives for the current Pecos River water operations NEPA process on making required water deliveries and targeting flows at critical habitat areas for the Pecos bluntnose shiner. The current version of RiverWare does not estimate snowmelt or rainfall runoff into the Pecos River basin nor does it model groundwater.

The current model was used to develop estimates for "net depletions" to the system from bypass releases made in 1998 and 1999. Remaining work includes the development of operational rules for potential alternatives for the current Pecos River water operations NEPA process. An unregulated flow analysis needs to be completed to develop input information to use for model simulations of NEPA alternatives. This input will be used along with information regarding historical or typical operations to develop a model simulation for the "No Action" alternative. The results from simulations for potential NEPA alternatives will be compared to the results from the "No Action" simulation to determine the "net depletion" to the system resulting from changing operations. Model results will also be used to assess the effects that changing operations have on compact accounting computations.

Roswell Drainage District Technical Investigations

A Memorandum of Understanding was signed in May 1997 to establish commitments between OSE for data analysis, the Pecos Valley Artesian Conservancy District for monitoring of the wells, and Reclamation for well installation and data analysis.

Reclamation's Technical Service Center drillers installed 33 observation wells during 1997. These wells in addition to a few existing dairy wells are being monitored through 2002. Data collection is being performed by the Conservancy District and transmitted to the OSE and Reclamation for analysis.

An interim report for 1999 was prepared by Reclamation. This report reveals that there has been a significant increase in ground water levels across a large part of the district since 1997. The wells that were higher in 1999 had an average increase of about 1 to 3 ft per well with one well rising about 8 ft. Only 2 wells had consistently high water levels of less than 4 ft from ground surface during the entire period. If this trend continues in the future, the area where the water is less than 4 ft from the surface will increase.

The report noted that some high water levels are in the summer and some in the winter. Reasons for this are not clear, but it probably results from localized irrigation pumping patterns and deep percolation from both irrigation and precipitation. It may also be associated with flow paths between the surface aquifer and the deep aquifer which is in an artesian condition.

Continued monitoring wells to determine long term trends is recommended, although the number of measurements per year may now be reduced.

Emergency Management Program

Reclamation's Emergency Management Policies and Directives were finalized in 1996. They provide for safety of the public and protects environmental resources from incidents involving Reclamation's storage dams. The directives require that the Emergency Action Plans (EAP) be rewritten for each dam to include initiating conditions, response levels, and expected actions.

The EAPs for Avalon, Brantley and Sumner Dams have been updated and exercised through a Tabletop Exercise. These exercises are a joint cooperative effort between Reclamation and various downstream entities, including municipal, county, and state agencies, other federal agencies, as well as others that may be affected by an incident at these dams. EAPs have been distributed and added to the Standing Operating Procedures for each dam.

Review of Operations and Maintenance Program

Field examinations of the radial gates, outlet works access tunnel and other features at Sumner Dam were performed by Reclamation's Technical Service Center and personnel from the Regional and Area Offices in February and May, 1999 as a part of the Comprehensive Facility Review process (see below) which is a continuation of exams performed in 1996, 1997 and 1998 . Recommendations were made regarding concerns of the stability of the radial gates from corrosion and the cracking of the concrete that embeds the trunnion anchors on the radial gates, possibly from corrosion of the anchors.

Evaluations will be needed to determine what the causes are and what needs to be corrected and then appropriate repairs made.

The sinkholes downstream of the left end of Brantley Dam are being monitored visually and with periodic surveying. The issue is being reviewed and evaluated as part of the Comprehensive Facility Review process.

As part of the Carlsbad Project maintenance, approximately 150 acres of salt cedar around Brantley Reservoir's shoreline and approximately 75 acres around the old McMillan lake bed were newly cleared in 1999. A few isolated old growth saltcedar areas remain inaccessible due to saturated ground conditions.

Facility Review Program

There were Comprehensive Facility Reviews (CFR) started on Sumner, Brantley, and Avalon Dams in 1999. The CFR will consist of a report of findings covering a state-of-the-

art review of the facility, a site examination, examination of normally inaccessible features, as needed, and development of a performance parameter document that identifies monitoring criteria and expected instrumentation performance etc. They are anticipated to be completed in early 2000.

A dive inspections of the outlet works, intake structures and stilling basins for Sumner and Brantley Dams were also performed as a part of this process. The final dive reports were received in December, 1999. The inspections found rock and boulder debris in the Sumner Dam stilling basin. It was recommended that this debris be removed to prevent future scour. All other Sumner Dam and all Brantley Dam apparatus were found to be in satisfactory condition.

Safety of Dams Program

The modification to Avalon Dam to correct an identified Safety of Dams inspection deficiency is proceeding. The erosion protection to be placed on the right side of and downstream of Spillway No. 1 along the toe of the dam has draft specifications and drawings completed with a construction contract award anticipated by late summer or early fall. There are still several steps to be completed before the work can be advertised for bid. It is anticipated that construction will begin by the end of 2000 and be completed within a year.

Pecos River Stream Adjudication

The Pecos River General Stream Adjudication (State Engineer v L.T. Lewis) is on-going in the 5th Judicial District Court in Chavez County, New Mexico. Reclamation is involved in this case as record title holder of the water rights for the Carlsbad Project.