

Department of the Interior  
BUREAU OF RECLAMATION  
ALBUQUERQUE AREA OFFICE

**2006**

**SUPPLEMENTAL WATER  
PROGRAM REPORT**

February 2007



## **Introduction**

The Rio Grande silvery minnow was listed as a federally endangered species on July 20, 1994. Dewatering of the river channel within the silvery minnow's habitat was identified as a key threat to the continued existence of the species. A sizeable portion of the silvery minnow's habitat is located within the mainstem of the Rio Grande between Cochiti Dam and San Marcial, which is a section of the river prone to critically low flows during the irrigation season.

The Final Rio Grande Supplemental Water Programmatic Environmental Assessment<sup>1</sup> (EA) was developed in compliance with the National Environmental Policy Act of 1969 to analyze the establishment of a Supplemental Water Program that would provide supplemental water to primarily benefit the silvery minnow.

## **Summary of the 2006 Supplemental Water Program**

The 2006 Supplemental Water Program was used to assist in achieving the targeted flows as described in the Biological and Conference Opinions on the Effects of Actions Associated with the Programmatic Biological Assessment of the Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande, New Mexico, dated March 2003 (BO).

Due to low runoff volumes on the Rio Chama in 2006, no additional water under the Emergency Drought Water Agreement was stored. At the beginning of 2006 there was just over 16,000 ac-ft of water available for endangered species. This water was exhausted by the middle of June. The EDWA pool in El Vado is currently empty, however, there is still the opportunity to store 4,934 ac-ft if supplies warrant and there is inadequate sources of water to meet the demands of endangered species.

In addition to the EDWA releases, 24,744 ac-ft of leased SJ-C water was released throughout the year beginning in mid March. A wet monsoon season from July through October made releases for endangered species largely unnecessary during that time frame.

Approximately 16,784 ac-ft was pumped from the Low Flow Conveyance Channel into the Rio Grande to keep the reach of river wet between San Acacia and Elephant Butte before June 15. After June 15 the pumps were used to control the rate of drying of the river channel to facilitate minnow rescue. Table 1 summarizes the water used in 2005 to supplement flows in the Rio Grande between Cochiti and Elephant Butte Reservoir

**Table 1 – Water Used in 2006 to Supplement flows in the Rio Grande**

<b>Source of Water</b>	<b>Volume (ac-ft)</b>
Leased 2006 SJ-C Contractor Allocation released	24,744
Emergency Drought Water Agreement	15,707
Water Pumped from LFCC into Rio Grande	16,784
<b>TOTAL</b>	<b>57,235</b>

Representatives from USBR, U.S. Army Corps of Engineers (USACE), USFWS, NMISC, and MRGCD participated in conference calls throughout the irrigation season to exchange information and discuss Agency actions. These calls provided an efficient means to coordinate water operations, LFCC pumping operations, and related silvery minnow rescue operations.

**Stream Flow Forecast and Estimated Actual Runoff**

The National Resource Conservation Service's (NRCS) May 1, 2006 stream flow forecast for the Rio Grande Basin<sup>2</sup> projected the total spring runoff to be well below average based on a basin snowpack at 20% of average which was only 14% of the amount received in the previous year. The May 1<sup>st</sup> forecast projected the most probable stream flow to range from highs of 70% of average for the inflow into Platoro Reservoir to a low of 6% of average for the Santa Fe River. It should be noted that NRCS snowmelt forecasts are unregulated forecasts of stream flow that would occur naturally without any upstream influences.

The 2006 spring snowmelt runoff in the Rio Grande basin was one of the worst on record with flows significantly below normal. March-July runoff stream flows at Otowi Bridge and San Marcial were estimated to be 35% and 11% of average, respectively. Table 2 presents the NRCS May 1, 2006 forecast volumes and estimated actual runoff for select stations within the Rio Grande Basin. Runoff stream flow volumes were estimated by adjusting actual stream flow data to account for existing upstream influences.

**Table 2 – May 1, 2006 NRCS Stream Flow Forecasts and Estimated Runoff (ac-ft)**

Forecast Point	Most Probable Runoff Volume (% 30 yr avg)	1971-2000 30 Year Average Volume	Estimated Runoff Volume (% 30 yr avg)
Embudo Creek at Dixon (Mar-Jul)	7,900 (16%)	51,000	7,000 (14%)
El Vado Reservoir Inflow (Mar-Jul)	86,000 (36%)	237,000	54,900 (23%)
Rio Grande at Otowi Bridge (Mar-Jul)	235,000 (31%)	757,000	268,000 (35%)
Santa Fe River near Santa Fe (Mar-Jul)	430 (9%)	4,600	785 (17%)
Jemez Canyon Reservoir Inflow (Mar-Jul)	4,000 (9%)	38,000	3,600 (9%)
Rio Grande at San Marcial (Mar-Jul)	65,000 (11%)	573,000	20,000 (3%)

**Leased SJ-C Water for 2006 Supplemental Water Releases**

Table 3 provides a summary of all SJ-C supplemental water leases and releases executed in 2006.

**Table 3 – Summary of San Juan-Chama Contractor Water Leased for 2006**

Dates of Release	Contractor	Volume (ac-ft)
4/05-4/07	Belen	692
4/19-4/20	Espanola	235
4/07-4/09	Los Alamos	1200
4/15-4/19	San Juan Pueblo	2000
10/28-11/11	Jicarilla Apache	5000
11/11-11/14	Santa Fe	2500*
12/19-12/22	Espanola	800*
12/23	Santa Fe County	375*
12/25-12/26	Red River	60*
	'05 Carryover	12,065
<b>Subtotal: 2006 Releases for ESA</b>		<b>24,744*</b>
<b>TOTAL 2006 LEASES</b>		<b>15,852</b>

\* released from Heron and stored in Abiquiu for future use

**Low Flow Conveyance Channel Pumping**

USBR operated and maintained 15 portable diesel driven pumps to transfer water from the LFCC to the Rio Grande during the 2006 irrigation season. The pumps are located between Socorro and Elephant Butte Reservoir, beginning at the Neil Cupp location approximately 2.8 miles north of Highway 380 and extending downstream approximately 5 miles south of San Marcial LFCC gage at Fort Craig. Figure 1 provides a map showing the general locations of LFCC pumping stations.

The first day that LFCC pumps operated was March 20, and the last day of pumping occurred on October 12. Approximately 16,784 AF was pumped from the LFCC to the Rio Grande during 2006. The approximate annual volume pumped by location is tabulated in Table 4.

**Table 4 – Approximate Annual Volume by LFCC Pumping Location**

<b>Pumping Location</b>	<b>No. of Pumps</b>	<b>Approximate Annual Volume (ac-ft)</b>
Neil Cupp	4	5,431
North Boundary Bosque del Apache NWR	3	1,900
South Boundary Bosque del Apache NWR	5	9,413
Fort Craig	3	40
<b>TOTAL</b>	<b>15</b>	<b>16,784</b>

# LFCC PUMP LOCATION MAP

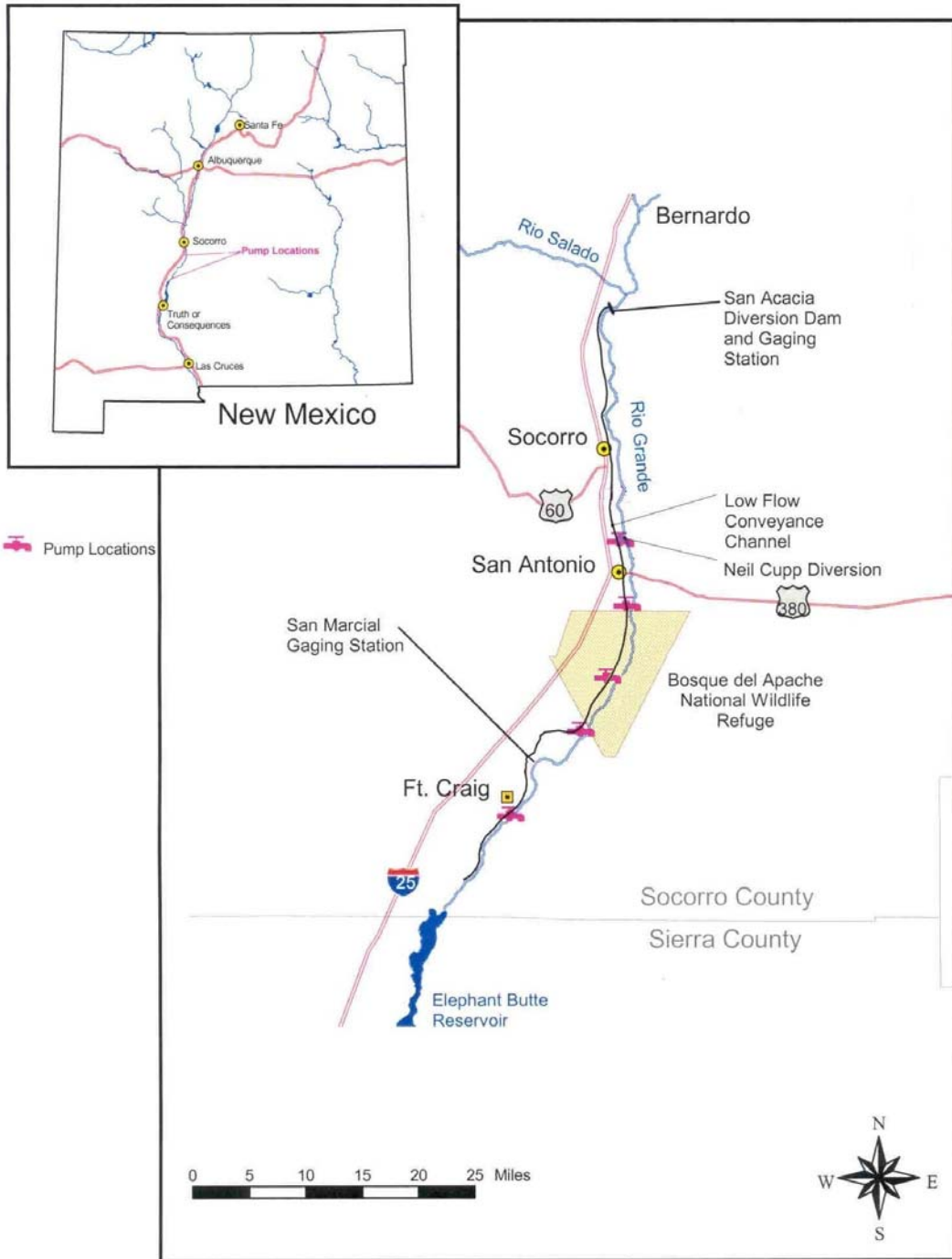


Figure 1 – Map Showing Low Flow Conveyance Channel Pumping Locations

Discharge measurement and telemetry installations were completed at the Neil Cupp, North Boundary Bosque del Apache, and South Boundary Bosque del Apache pumping stations. Discharge data from these sites is now posted on USBR's ET Toolbox web site at the following URL:

<http://www.usbr.gov/pmts/rivers/awards/Nm/rg/RioG/gage/schematic/SCHEMATICsouth.html>

### **Actual San Acacia and San Marcial Flows Compared to Target Flows**

Supplemental water was used to assist in achieving the targeted flows as described in the March 2003 (BO). The elements of target flows are based on the April 1 runoff forecast for the Otowi Gage which determines whether the year will be declared a Dry, Average, or Wet year. Years in which Article VII of the Rio Grande Compact are in effect are declared Dry years. 2006 was classified as a Dry year since Article VII was in effect, and the protocols for a Dry year were followed.

Target flows at Albuquerque, San Acacia, and San Marcial as described in Reasonable and Prudent Alternative Water Operations Elements E and F are summarized in the following paragraphs.

#### **Element E**

“Action agencies, in coordination with parties to the consultation, shall provide continuous river flow from Cochiti Dam to the southern boundary of the silvery minnow critical habitat from November 16 to June 15.

#### **Element F**

“Action agencies, in coordination with parties to the consultation, shall provide year-round continuous river flow from Cochiti Dam to the Isleta Diversion Dam with a minimum flow of 100 cfs at the Central Bridge (Albuquerque) Gage.

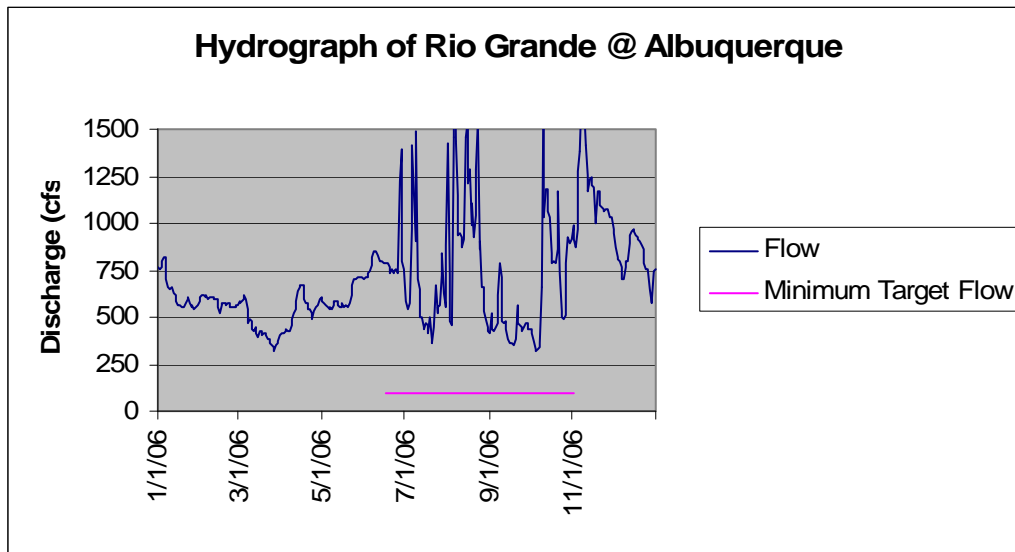
Figure 2 shows the target flow of 100 cfs and the actual measured flow at the USGS gage 08330000 Rio Grande at Albuquerque, NM. Flows through Albuquerque were well above the target flow during all of 2006. Reclamation kept continuous flows throughout the river until May 19, when unexpected intermittency occurred in the Socorro reach. The river completely re-wet around May 28, and remained continuous past June 15 when the river was intentionally dried below San Acacia as allowed in the BO. Above average monsoons throughout the summer resulted in several episodes of drying and re-wetting within the Socorro reach. Figure 3 illustrates the impacts of the summer monsoons as measured at the USGS gage 08358400 Rio Grande Floodway at San Marcial, NM.

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<sup>1</sup> *Final Rio Grande Supplemental Water Programmatic Environmental Assessment*, March 2001 (USBR 2001)

<sup>2</sup> *New Mexico Basin Outlook Report, May 1, 2006* (USDA / NRCS 2006)

**Figure 2 – Measured Albuquerque Discharge**



**Figure 3 – Measured San Marcial Discharge**

