

RECLAMATION

Managing Water in the West

Calendar Year 2013 Report to the Pecos River Commission

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Department of the Interior
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Upper Colorado Region
Albuquerque, New Mexico

April 2014



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Introduction

The Albuquerque Area Office (AAO) of the Bureau of Reclamation (Reclamation) has oversight responsibilities for three projects on the Pecos River. These projects are the *Carlsbad Project*, which includes Sumner, Brantley, and Avalon Dams; the *Pecos River Basin Water Salvage Project*; and the *Fort Sumner Project*, which includes the Fort Sumner Diversion Dam. Figure 1 depicts the general location of the Projects on the Pecos River.

Reclamation prepared this Annual Report to the Pecos River Compact Commissioners to convey all required reporting information on the three projects mentioned above. It will also inform the Commission of proposed changes in programs and management activities and strategies that may affect operations, operating conditions, and/or the Compact, including Endangered Species Act (ESA) issues.

An agreement between Reclamation and Carlsbad Irrigation District (CID), finalized on October 2, 1989, provides for CID to operate and maintain Brantley Dam, Avalon Dam, Sumner Dam, and the Pecos River Water Salvage Project. 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. The Pecos River Water Salvage Project was not funded in fiscal year 2013.

The gage data used within this report was downloaded from the United States Geological Service (USGS) web page, <http://waterdata.usgs.gov/nm/nwis/dv>. The dam tenders recorded and reported the provisional reservoir elevation data to Reclamation on a monthly basis.

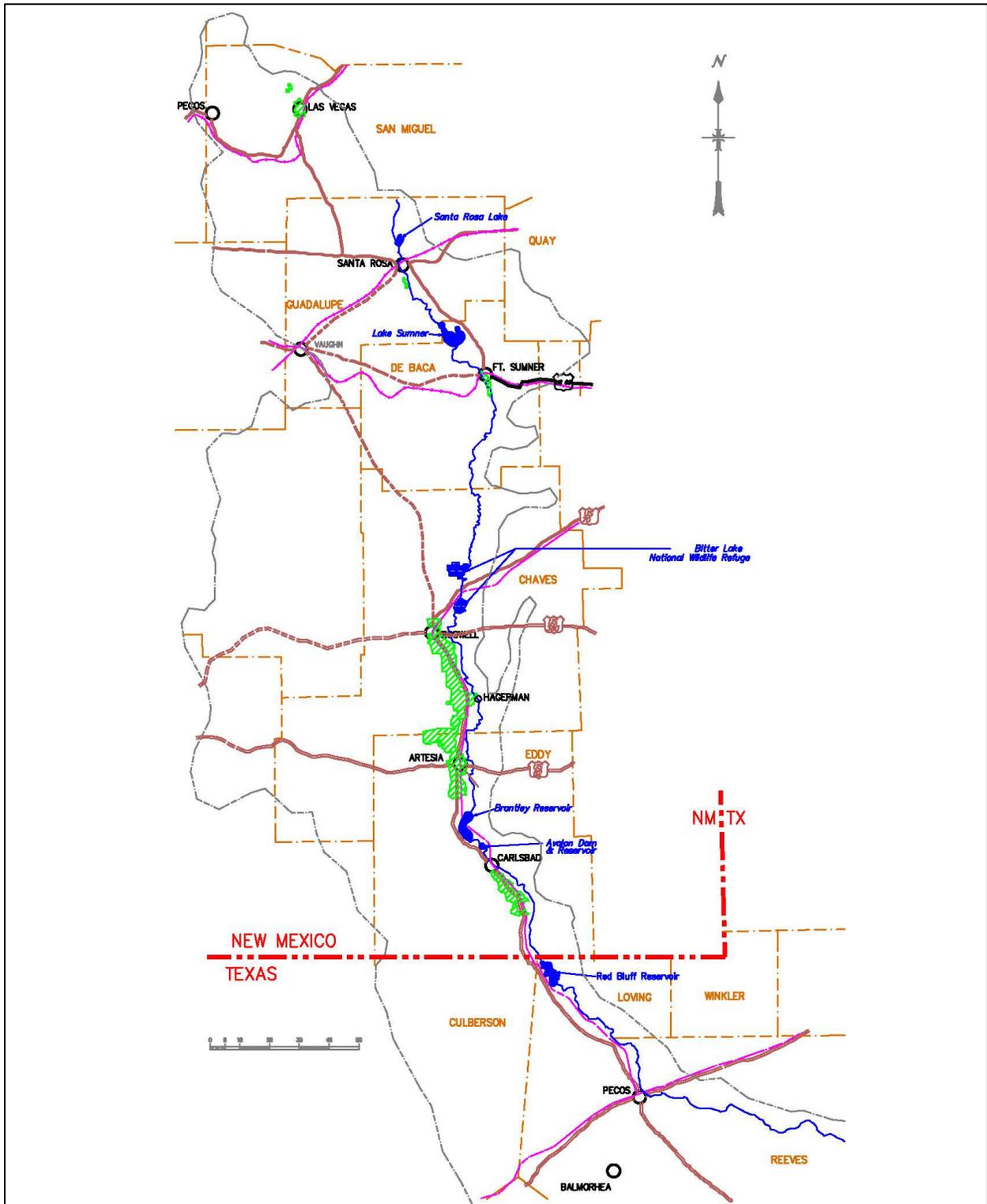


Figure 1: Reclamation's Projects Map on the Pecos River

Pecos Basin Water Accounting

Reclamation and the New Mexico Interstate Stream Commission (NMISC) account for water use based on a 5-year Depletions Agreement for ESA water use (2006-2012). Reclamation is working with NMISC and Carlsbad Irrigation District (CID) to develop a new agreement.

As a tool for water management and accounting, Reclamation has constructed an accounting model for the Pecos Basin, using RiverWare® software. Reclamation has proposed this management and accounting model as a replacement for the spreadsheet accounting detailed in the Depletions Agreement.

Carlsbad Project Operations

Reservoir Storage Entitlements

Reclamation operates all Carlsbad Project reservoirs in accordance with the requirements of the Pecos River Compact and U.S. Army Corps of Engineers' (Corps) flood control criteria. Figure 1 depicts the location of the Carlsbad Project storage dams on the Pecos River. Operation of the dams on the Pecos River is a joint effort between Reclamation, CID, and the Corps in coordination with the Fort Sumner Irrigation District (FSID) and the State of New Mexico.

Reclamation calculated annual total conservation storage entitlements for the four Pecos River reservoirs, (Santa Rosa, Sumner, Brantley, and Avalon) that are in New Mexico. Table 1 presents the calendar year 2013 storage entitlements for these Reservoirs. Note that Santa Rosa and Avalon elevations reference a project datum.

The 2013 start-of-year total Carlsbad Project conservation storage in the Pecos River reservoirs was 12 percent of entitlement. Santa Rosa, Sumner, Brantley, and Avalon Reservoirs were at approximately 5, 23, 12, and 65 percent, respectively, of each Reservoir's entitled conservation storage. On December 31, 2013, the total Carlsbad Project entitlement storage in the Reservoirs was 93 percent of entitlement. Santa Rosa, Sumner, Brantley, and Avalon Reservoirs were at approximately 95, 108¹, 80, and 59 percent, respectively.

¹ During the winter months, Sumner is allowed to store an additional 20,000 af above the entitlement storage as long as the total entitlement storage is not exceeded in for all four reservoirs.

Table 1: Pecos River Reservoir Storage Entitlements for 2013

Reservoir	Entitlement Storage (af)	Minimum Pool (af)	Total Estimated Sediment Accumulation (af)	Total Conservation Storage (af)	Conservation Elevation (feet)
Santa Rosa	98,072	0	5,693	103,765	4746.79
Sumner	34,562	2,500	513	37,575	4,260.88 (NAVD88)
Brantley	40,000	2,000	1,862	43,862	3,256.55 (NAVD88)
Avalon	3,866	600	0	4,466	3,117.40
TOTAL:	176,500				

The National Resource Conservation Service’s May 1, 2013, most probable snowmelt runoff forecast predicted approximately 11,300 acre-feet (af) of inflow into Santa Rosa Reservoir, or 21 percent of the 30-year average. The actual March through July inflow to Santa Rosa Reservoir was just above 6,700 af, approximately 8 percent of the 30-year average.

Santa Rosa Reservoir Sediment Accumulation

The Corps calculated the sediment accumulation for Santa Rosa Reservoir. The most recent sediment survey was performed in 1996. The area-capacity table was retroactive to January 1, 1997. Table 2 is an annual tabulation of estimated deposition since January 1, 1997. The estimated sediment deposition since the last sediment survey was 5,693 af.

Table 2: Estimated Sediment Accumulation for 2013 Santa Rosa Storage Entitlement

Calendar Year	Sediment Accumulation (af)
1997	760
1998	475
1999	532
2000	537
2001	327
2002	89
2003	81
2004	341
2005	711
2006	375
2007	264
2008	316
2009	252
2010	487
2011	49
2012	97
Total	5,693

Sumner Reservoir Sediment Accumulation

The basis of the estimated sediment accumulation calculations for Sumner Reservoir is the ratio of total sediment deposition to total inflow during the period between the May 1989 and May 2001 sediment surveys. Inflow to Sumner Reservoir was measured at the USGS gage, Pecos River near Puerto De Luna, NM (PDL). The total sediment deposition during this period was the difference in the content between the 1989 and 2001 surveys at the top of conservation pool, elevation 4,262.88 feet (NAVD 88 vertical datum, 4261.00 feet referencing local vertical datum). At the request of the CID, the top of conservation pool was lowered two feet, to 4,260.88 feet (NAVD 88 vertical datum, 4259.00 feet referencing local vertical datum), for storage entitlements beginning in 2013.

The total sediment deposition divided by the total inflow obtained an average ratio of sediment deposition to inflow during this period. To estimate sediment deposition in a given period, calendar year inflow is multiplied by this ratio. Table 3 shows an annual tabulation of the inflow and estimated sediment accumulation since June 1, 2001. The estimated sediment deposition since the last sediment survey was 513 af. Reclamation conducted a new sediment survey in March of 2013 and it will be ready for use in 2014.

Table 3 Estimated Sediment Accumulation for 2013 Sumner Storage Entitlement

Calendar Year	Inflow (af)	Sediment Accumulation (af)
6-12/2001	68,140	29
2002	74,938	31
2003	77,328	32
2004	110,815	47
2005	121,739	51
2006	123,937	52
2007	120,331	51
2008	135,632	57
2009	108,464	46
2010	121,238	51
2011	86,281	36
2012	71,006	30
Total		513

Brantley Reservoir Sediment Accumulation

The basis of the estimated sediment accumulation calculations for Brantley Reservoir is the ratio of total sediment deposition to total inflow during the period between the September 1988 and May 2001 sediment surveys. Inflow to Brantley Reservoir is measured at the USGS gage, Pecos River near Lakewood, NM (Kaiser Channel). The total sediment deposition during this period was the difference in the content between the 1988 and 2001 surveys at the top of the designated conservation pool, elevation 3,272.69 feet (NAVD 88 vertical datum, 3271.00 feet referencing local vertical datum). Total sediment deposition divided by the total inflow yields an average ratio of sediment deposition to inflow during this period.

Annual sediment deposition since the 2001 survey is estimated by multiplying this ratio by the calendar year inflow. Table 4 shows estimated inflow and sediment accumulation since June 1, 2001. The estimated sediment deposition since the last sediment survey was 1,862 af. Reclamation surveyed Brantley for sediment in April 2013 and the data will be ready for use in 2014.

Table 4: Estimated Sediment Accumulation for 2013 Brantley Storage Entitlement

Calendar Year	Inflow (af)	Sediment Accumulation (af)
6-12/2001	28,124	50
2002	77,850	139
2003	54,828	98
2004	140,612	250
2005	130,068	232
2006	125,889	224
2007	106,655	190
2008	111,291	198
2009	81,856	146
2010	107,209	191
2011	53,643	95
2012	27,432	49
Total		1,862

Sumner Dam and Reservoir

Sumner Dam Operations

Operations at Sumner Dam collect available natural inflow above FSID's allotted direct diversion water right, contingent on bypass water not being required. Bypasses are required to meet the 35 cubic feet per second (cfs) target at the USGS gage, Pecos River below Taiban Creek near Fort Sumner, or to maintain continuous flow in the river as targeted by the 10-year Biological Opinion (10-year BO) (2006-2016, Cons. #22420-2006-F0096) implemented in 2006

for the Pecos bluntnose shiner (shiner). FSID has a direct diversion right of up to 100 cfs of the natural inflow into Sumner Reservoir as calculated by the New Mexico Office of the State Engineer (NMOSE) in their two-week average inflow calculation.

Stored Carlsbad Project water is released as a block. The duration of block releases is restricted to a maximum of 15 contiguous days, and the cumulative annual duration of all block releases is restricted to a maximum of 65 days annually. Scheduled block releases should have a minimum of 14 days between releases, and block releases should avoid the six-week period around August 1. These restrictions are in accordance with the 10-year BO. CID schedules block releases in cooperation with Reclamation to alleviate river intermittency as long as this scheduling does not constitute a wasteful use of water due to excessive net losses accrued during transit, or due to excessively high net downstream reservoir evaporation. Reclamation directs the CID dam tender on gate adjustments and CID is responsible for all maintenance activities. This operating procedure does not alter the normal operations of Avalon and Brantley Reservoirs for delivering water to CID.

Under a water right permit granted by the State of New Mexico, the Carlsbad Project is allowed to store up to 20,000 af above its storage entitlement in Sumner Reservoir from November 1 to April 30 each year, provided that the entitlement storage of all four reservoirs on the Pecos River in New Mexico does not exceed 176,500 af. An additional 2,656 af were in storage under this water right permit on December 31, 2013.

During 2013, Reclamation stored 3,500 af in Sumner Reservoir to provide releases to achieve target flows at the Taiban gage and avoid intermittency in the river. This water was stored and released under the Carlsbad Project Water Supply Management Agreement between the United States and CID. Of the 3,500 af stored, 1,000 af (known as the Fish Conservation Pool) was released out of Sumner Reservoir and replaced with 888 af of water that Reclamation pumped directly into Brantley Reservoir. Another 2,500 af was acquired through the Contract between the United States and FSID (Contract No. 08-WC-40-292; FSID Forbearance Agreement Pool). Reclamation stored this water in February and March and released it during the irrigation season.

Sumner Reservoir began the year with 9,730 af in total storage. Total storage peaked on September 21 at 38,537 af. The first block release was initiated on March 14 and terminated on March 17 at an average rate 1,300 cfs, for a total release of 10,409 af. The second release was unplanned, and was to release floodwaters stored in the Reservoir during 2013's large September storms. It began on September 21 and terminated on October 7 for 6,150 af. Sumner Reservoir's lowest total storage occurred on June 29, at 3,338 af, prior to a "mini" block release from Santa Rosa. Sumner Reservoir ended the year with 37,731 af in storage. Figure 2 depicts Sumner Reservoir's storage and releases.

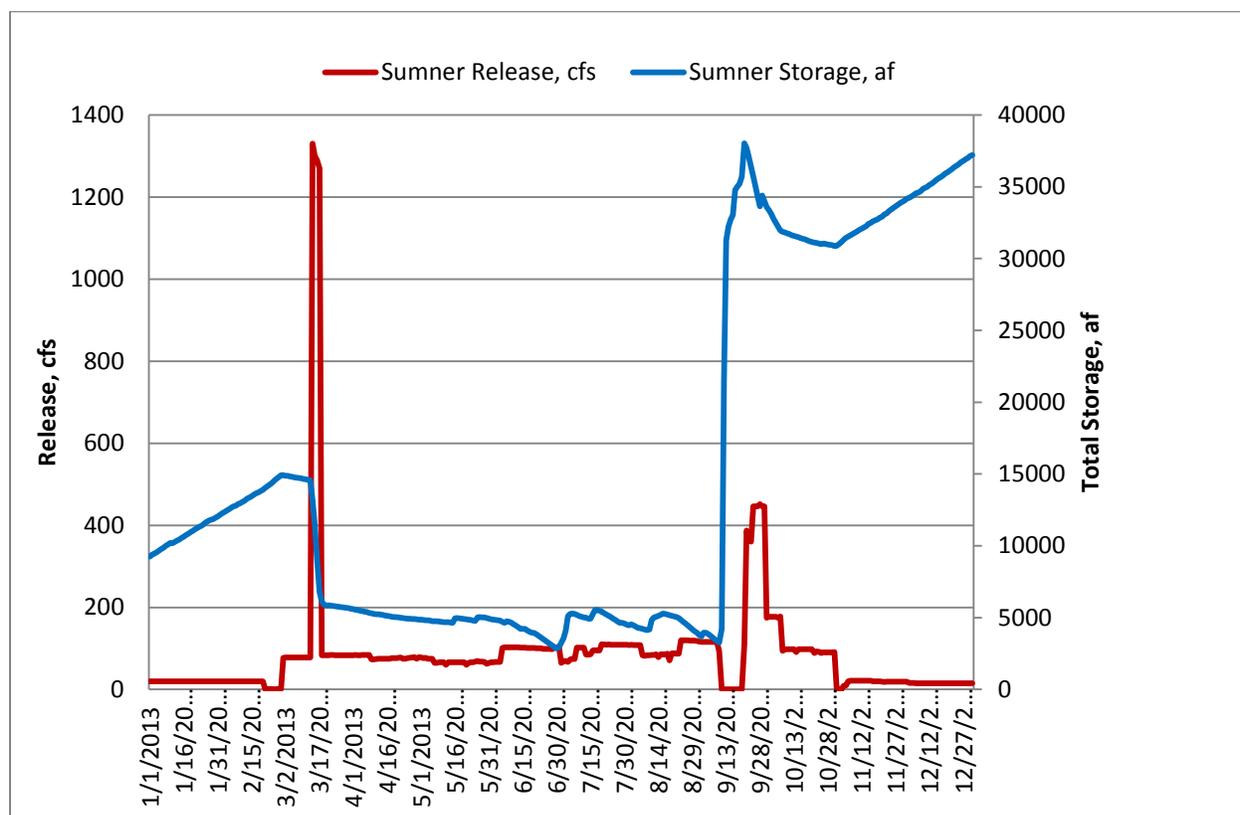


Figure 2: Release and Storage for Sumner Reservoir

On Tuesday September 10, 2013, a rain event started with 3.85 inches of local rain at the dam site (weather station). On Wednesday September 11, 2013, 4.04 inches of rain was collected at the weather station and the inflow gage reached a high of 36,000 cfs. In some areas of the Pecos River north of Sumner Dam, the river was approximately 700 feet wide and 30 feet deep in an area where it is normally 70 feet wide and 3 feet deep. On September 10, 2013, Sumner Reservoir gained 940 af and two feet elevation. On September 11, 2013, Sumner gained 17,253 af and 16.73 feet in elevation. The reservoir went from 496 surface acres to 1,764 surface acres. While inflow slowed, Sumner continued to gain, with a total gain of 26.42 ft in elevation and 34,748 af. On September 21, 2013, 450 cfs was released to match inflows and create storage space for a foreseeable release from Santa Rosa, as they also reached their max conservation storage elevation. The greatest rate of rise at Lake Sumner was recorded on September 12, with a maximum of 1.6 ft per hour occurred between 1:00am and 2:00am.

A total of 1,706 af was bypassed for ESA related purposes between January 1 and February 12, during the non-irrigation season, at an average rate of 18 cfs. There were no bypass flows during the irrigation season, which runs from March 1 through October 31, but 1,000 af was released from the Fish Conservation Pool and 2,500 af from the FSID Forbearance Agreement Pool. During the non-irrigation season, between November 1 and December 31, 2,058 af of additional CID forborne water was bypassed for ESA related purposes. Additional water for ESA was acquired under a fallowing agreement with FSID and is discussed under the FSID operations

section. The section on Reclamation's water offset program discusses the effects of these modified operations on the Carlsbad Project.

Sumner Dam Facility Review and Safety of Dams Programs

An Annual Site Inspection was performed on Sumner Dam on July 30, 2013. The next exam for Sumner Dam is a Periodic Facility Review, scheduled for April 1, 2014. No security issues were reported at Sumner Dam in 2013. A Periodic Security Inspection is scheduled for April 1, 2014. Of 107 total O&M recommendations, 16 are incomplete for Sumner Dam. All three radial gates at Sumner Dam, with a total design capacity of up to 56,000 cfs, are in need of repairs. CID is responsible for the repairs and 68.36% of the repair cost. Reclamation is responsible for 31.64% of the repair cost. Reclamation has helped CID prepare for this project by providing information regarding planning, designs, schedules, cost estimates, and environmental issues. Classroom Dam Tender Training was completed on March 6, 2013. Onsite Dam Tender Training is scheduled for April 1, 2014.

There were no major repairs done to the radial gates during 2013, although routine maintenance and lubrication of radial gate chains were performed. CID plans to complete the remaining work on the radial gates on an annual basis and should finish the entire rehabilitation by 2016. On July 29, 2013, a pickup truck traveling west on State Road 203 drove off the east end of the spillway radial gate bridge. The pickup truck went through fencing and pipe railing, hit an H-brace on radial gate and landed upside down on the upper spillway, downstream of the radial gate. CID is responsible for repairing the damage to the chain link fence and the radial gate, and has scheduled time to do so in FY 2014. The driver was not seriously injured and walked away from the scene and called for help on his cell phone. The accident was attributed to inattentiveness of the driver.

Brantley Dam and Reservoir

During periods without irrigation releases, Brantley Dam bypasses mitigation flows of 20 cfs. During the irrigation season, releases are made from Brantley Dam to Avalon Reservoir at a rate necessary to support the diversion into CID's main canal, generally between 75 and 350 cfs, as required by irrigation demand.

Brantley Reservoir began the year with a total storage of 4,839 af. Irrigation releases from Brantley commenced on April 18 and were then made as needed to meet demand and conserve water. The final irrigation release from Brantley Reservoir occurred on October 30. Approximately 59,735 af was released from Brantley during this period. Of that, approximately 32,736 af, released from September 22 to October 3, was to evacuate floodwater collected during the large September storms. Brantley Reservoir reached a maximum total storage of 38,615 af on September 22, 2013. The lowest total storage occurred on August 21 with a volume of 4,353 af.

Brantley Reservoir ended the year with a total storage of 31,911 af. Figure 3 depicts Brantley Reservoir’s storage and releases.

Brantley Dam Facility Review and Safety of Dams Programs

An Annual Site Inspection was performed on Brantley Dam on August 5, 2013. The next exam is a Periodic Facility Review, scheduled for April 2, 2014. No security issues were reported at Brantley Dam in 2013. A Periodic Security Inspection is scheduled for April 2, 2014. Of 65 total O&M recommendations, seven are incomplete for Brantley Dam. Classroom Damtender Training was completed on March 6, 2013. Onsite Damtender Training is scheduled for April 2, 2014.

There are sinkholes upstream and downstream on the left areas of Brantley Dam. The sinkholes are monitored visually on a regular basis, and are photographically surveyed/documentated every eight years. The latest survey was in March 2010. The sinkholes seem to be filling in naturally, and fewer were found since the previous survey in 2005. In March 2013, a new service water well was drilled behind the Brantley Dam Shop.

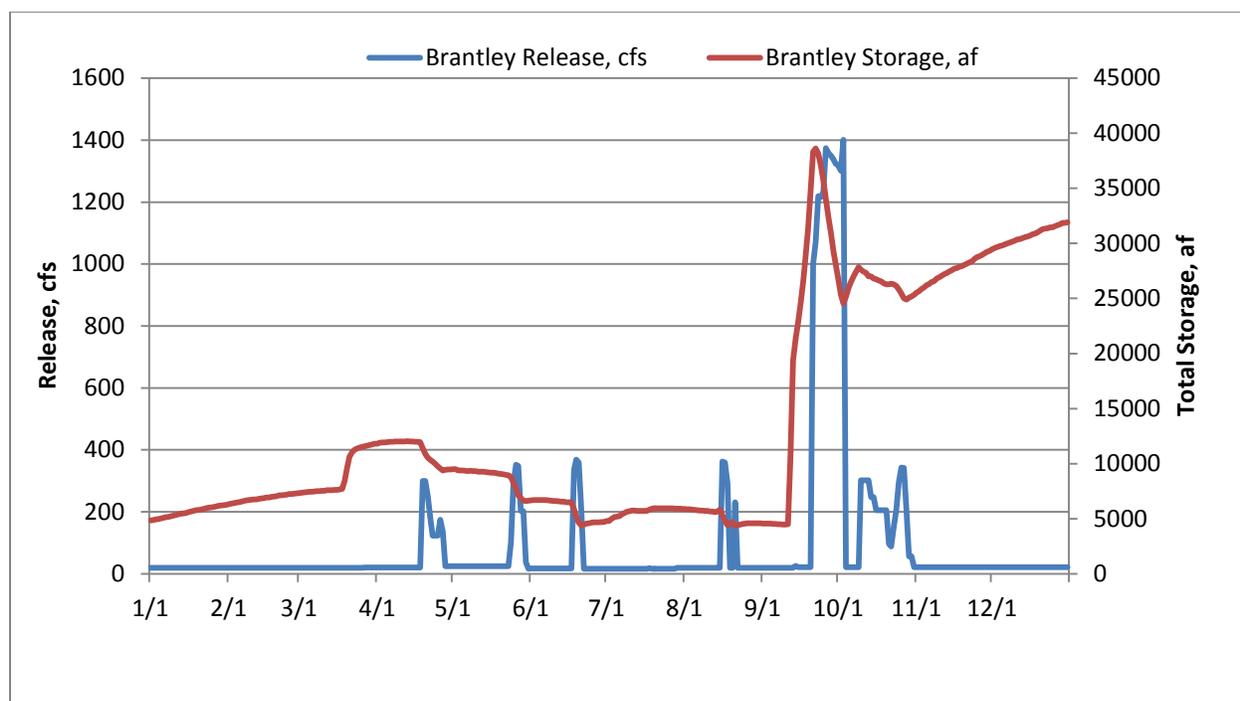


Figure 3: Release and Storage for Brantley Reservoir

Avalon Dam and Reservoir

Due to the small reservoir capacity and the location of Brantley Dam 10 miles upstream, Avalon Dam is used primarily as a diversion dam to meet irrigation demand for CID. Water released from Brantley Dam is re-regulated by the small reservoir at Avalon, which releases it into the CID Main Canal. Avalon Reservoir began the year with 2,457 af and ended the year with 2,300 af. It reached a maximum storage of 5,702 af on August 13, and a minimum of 810 af from October 31 to November 4. Diversions into the CID Main Canal began on April 15 and ended on October 31, 2013, delivering 32,966 af.

Avalon Dam Facility Review and Safety of Dams Programs

In 2013, CID removed woody vegetation from spillway #3 and from the downstream side of the Dam. An Annual Site Inspection was performed on Avalon Dam on August 5, 2013. The next exam is a Periodic Facility Review, scheduled for April 3, 2014. No security issues were reported at Avalon Dam in 2013. A Periodic Security Inspection is scheduled for April 3, 2014. Of 66 total O&M recommendations, 12 are incomplete for Avalon Dam. Classroom Damtender Training was completed on March 6, 2013. Onsite Damtender Training is scheduled for April 3, 2014.

Carlsbad Project Environmental Compliance

Reclamation's Direct Flow Operations

Reclamation has a lease agreement with the NMISC for up to 1,800 af (consumptive use) of well water (Vaughan) to be pumped into the Pecos River annually. The Vaughan Pipeline (Pipeline) supplements flows on the Pecos to meet the needs of the 10-year BO. The outfall structure of this pipeline is located upstream of the USGS' Taiban Gage. Maximum output during 2013 was between 8 and 9 cfs. The Pipeline provided 1,576 af of the 1,583 af purchased for 2013.

Reclamation is working with the NMISC and NMOSE to get a five-year accounting period for the Pipeline. The extended accounting period would allow Reclamation to conserve water in wet years for use in dry years, thereby providing greater flexibility in meeting the 10-year BO requirements.

Another lease for 1,180.2 af of shallow well water, Lynch, was discontinued in 2013. This lease was intended to provide pumped water to the Pecos River above the USGS' Pecos River Near Acme Gage, but little benefit was observed.

In addition to the lease agreements described above, Reclamation has established a 1,000 af Fish Conservation Pool in Sumner Reservoir through an exchange of 750 af of water from rights it owns at Seven Rivers. Water pumped into Brantley Reservoir from wells at Seven Rivers is exchanged for water released from Sumner Lake to maintain streamflow for the shiner. All of the Fish Conservation Pool was released from July 19 to August 6, 2013.

Under a forbearance agreement with FSID, 2,500 af were stored for Reclamation under CID's storage right at Sumner Lake. The stored water was released from June 5 to July 18, 2013.

Reclamation entered into a fallowing agreement with FSID farmers during 2013. The agreement gave Reclamation a portion of FSID's two-week allotment, which was diverted into the FSID Diversion Dam and then returned to the river via the Sand Gate Diversion from the Ft. Sumner Canal. Water under this agreement began returning to the River on March 30 and continued through the end of the irrigation season on October 31. A total volume of 2,959 af was delivered to the River under this agreement.

Reclamation's Water Offset Program

Reclamation leases water rights from willing owners within the Pecos River Basin to offset the additional depletions caused by ESA related operations. Reclamation is entirely dependent on the availability of willing water rights holders and congressional budget decisions to meet the instream flow requirements of the 10-year BO.

From November 1, 2012, through October 31, 2013 (the 2013 accounting year), Reclamation had water lease agreements with five Pecos River pumpers, one of whom is also a Hagerman Irrigation Company irrigator, to lease 1,842.9 af (consumptive use portion) of surface water rights and 507 af (consumptive use portion) of Hagerman Canal water rights. The land associated with the leased water was fallow. The Hagerman Canal water was pumped directly into the Pecos River.

Final calculations produced using the Pecos Annual Accounting Method, developed jointly by the NMISC and Reclamation; indicate that for the 2013 water year Reclamation's Carlsbad Project Water Acquisition (CPWA or Offset) Program put 1630 af more water into the Pecos River than the additional depletions incurred by the modified operations of Sumner Dam. Reclamation bypassed 4,475 af and released 2,500 af of 2013 forbearance water creating 1,475 af of additional depletions for the 2013 water year. CPWA amounts of 3,038 af (adjusted for consumptive use, transmission loss, and Brantley evaporation) was provided at Brantley Reservoir for the water year to eliminate these additional depletions, resulting in a Reclamation credit of 1,563 af for the 2013 water year.

Endangered Species Program

Pecos Bluntnose Shiner

Reclamation continues to monitor flows under the 10-year BO initiated in August 2006. The 10-year BO and Environmental Impact Statement (EIS) committed Reclamation to operate the Carlsbad Project with a target flow of 35 cfs at the Taiban Gage and to keep the river continuous in order to conserve the federally protected Pecos bluntnose shiner (*Notropis simus pecosensis*).

Drought conditions continued into 2013, with low flows and river intermittency for the third year in a row. Drying did not occur in the designated critical habitat sections of the river, but there was river intermittency through the Acme reach. Reclamation received an annual update on the status of the shiner from the U.S. Fish and Wildlife Service (USFWS). In 2013, shiner population density and relative abundance sharply decreased relative to the previous years (Figure 4). Per the 10-year BO, take is exceeded if density falls below a two-year catch-rate mean of 3.5 shiner per 100 m² in Trimester 1 (January-April), and 8 shiner per 100 m² in Trimester 3 (September-December) for years after 2010. In 2013, catch-rates during Trimester 3 fell below the prescribed density thresholds set by the 10-year BO (Table 5). Shiner catch rates were above the BO thresholds for Trimester 1.

Table 5: Pecos bluntnose shiner (PBS) two year mean population density with standard error and number of samples (N) for 2006 to 2013. Two-year running average was calculated from site means for the year stated and preceding year (for example in 2006, by calculating mean from all sites for trimester one in 2005 and 2006; same for trimester three).

Year	Trimester one PBS/100 m ²	Trimester three PBS/100 m ²	Any trimester 2008
2006	3.5 (± 0.75 SE, N = 48)	5.3 (± 0.90 SE, N = 48)	> 2.7 (2.5)
2007	5.0 (± 0.8 SE, N = 53)	9.8 (± 1.8 SE, N = 50)	> 4.0 (2.5)
2008	7.2 (± 1.3 SE, N= 62)	14.3 (± 4.5 SE, N= 59)	> 9.8 (2.5)
2009	11.9 (± 1.9 SE, N= 64)	17.4 (± 3.8 SE, N= 73)	> 15.2 (2.5)
2010	13.1 (±2.1 SE, N = 75)	21.0 (± 2.2 SE, N = 82)	> 12.3 (2.5)
2011	18.4 (± 2.2 SE N = 58)	21.3 (± 2.6 SE N = 81)	> 18.4 (2.5)
2012	21.6 (± 5.1SE N = 55)	14.7 (± 3.0 SE N = 62)	NA
2013	11.25 (± 5.4SE N = 47)	5.0 (±1.3SE N = 46)	NA

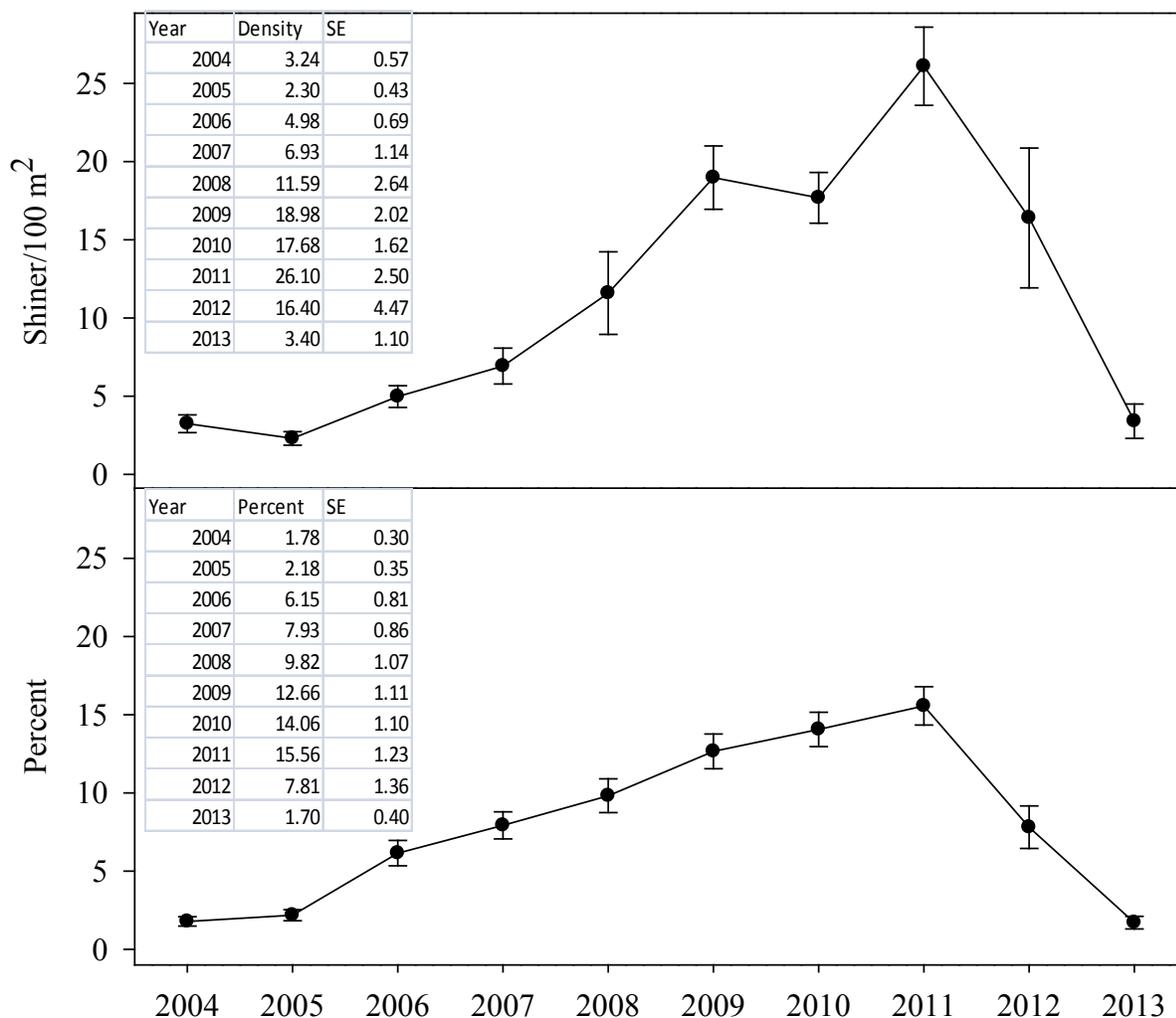


Figure 4: Pecos bluntnose shiner annual population density (top) and percent abundance (bottom), ±one standard error, for years 2004 through 2013, Pecos River, New Mexico

Least interior Tern

Water levels in Brantley Reservoir during 2013 were the lowest observed since terns were first documented nesting at Brantley in 2004, reaching a low of 3232.8 feet on June 21st. Reservoir levels remained low throughout the spring and summer due to the lack of an upstream block release, exposing vast areas of potential nesting habitat throughout the tern breeding season. Terns were first observed on May 24, and 110 Least Terns, including 99 adults and 11 first summer adults, were observed in total during 2013. Eight or more individuals were observed on several occasions and multiple instances of courtship and/or copulation were recorded.

It was assumed that up to four breeding pairs were residing at Brantley during the tern breeding season. Two nests were located on the water's edge on July 19 and the area was cordoned off two days later to prevent disturbance by recreational users of the State Park. One nest had apparently been depredated as evidenced by broken tern eggshells nearby. The second nest was active, containing two eggs upon discovery. It was monitored for 17 days and was ultimately abandoned. The cause of abandonment is unknown, however as discussed above, it was likely due to the late initiation of nesting and the onset of migration. Terns were last observed at Brantley on August 5.

Nesting habitat abundance given the low water levels and increased shoreline made conditions at Brantley Reservoir ideal for terns in 2013, however, no successful nesting was observed. The annual 2013 report was completed in accordance with the 10-year BO.

Pecos River Restoration

Under the 2006 Biological Opinion, Reclamation also agreed to “assist in the completion of ongoing habitat improvement projects on the Pecos River and to restore 1 to 1.5 miles of quality habitat within the Farmlands reach by 2009 and another 1 to 1.5 miles by 2014.” In 2009, Reclamation funded and completed a channel restoration project that reconnected Oxbow 4 at Bitter Lake National Wildlife Refuge (BLNWR) to the mainstem.

The second habitat improvement project is located at Bureau of Land Management (BLM) Overflow Wetlands Area of Critical Environmental Concern (ACEC), south of the BLNWR restoration project. Lands in the project area are managed by the Roswell Field Office of the BLM, the NM State Land Office that manages State Trust Lands in the project area, and private landowners. According to the 2006 Biological Opinion, activities that restore and optimize the interaction of river channel and floodplain habitats with available flows will be most successful in mitigating the observed displacement of the shiner eggs and in providing a variety of channel conditions favorable to the different life stages of the shiner. Restoration activities for the second project included removing non-native vegetation, lowering and contouring riverbanks, and excavating smaller bank sites. The first phase of the project was completed in 2013, and the second phase will be constructed in 2014.



Figure 5: Pecos River Restoration Project at Overflow Wetlands, Chavez County, NM, bank excavation site - Lopez property, October 23, 2013. At higher flows, the site will be inundated.

Pecos River Basin Water Salvage Project

In past years, Reclamation has controlled saltcedar growth from the Sumner Dam area to the New Mexico - Texas state line under the authority of Public Law 88-594. However, this activity was not funded in fiscal year 2013. The NMISC has historically contributed funds for the work, but were unable to contribute funds in FY 2013. Reclamation previously accomplished the work by contracting with the Carlsbad Irrigation District for mechanical removal of the saltcedar. Total land previously cleared in New Mexico is approximately 33,200 acres.

Fort Sumner Project

Operations

The irrigation season for FSID typically begins March 1 and ends October 31. FSID is allowed to divert for 2 eight-day periods during the winter. This winter allotment has generally been taken just prior to March 1. In 2013, FSID forbore 2,500 af of their winter allotment to Reclamation under Contract No. 08-WC-40-292.

FSID began diverting water for irrigation on March 1 and ended irrigation for the year on October 31. During the irrigation season, 64 to 100 cfs was bypassed through Sumner Reservoir, depending on FSID’s available water right. A total of 34,558 af were diverted into the FSID main canal as recorded by the USGS Fort Sumner Main Canal Near Fort Sumner, NM, gage, shown in Figure 5.

Under a fallowing agreement between FSID and Reclamation signed in March, individual members signed up acreage to be fallowed. The portion of water that would have been used to irrigate these lands was returned to the River through the Sand Gate Weir off the Sumner Main Canal. Returns to the River began March 30 and continued through the end of irrigation season, for 2,959 af returned.

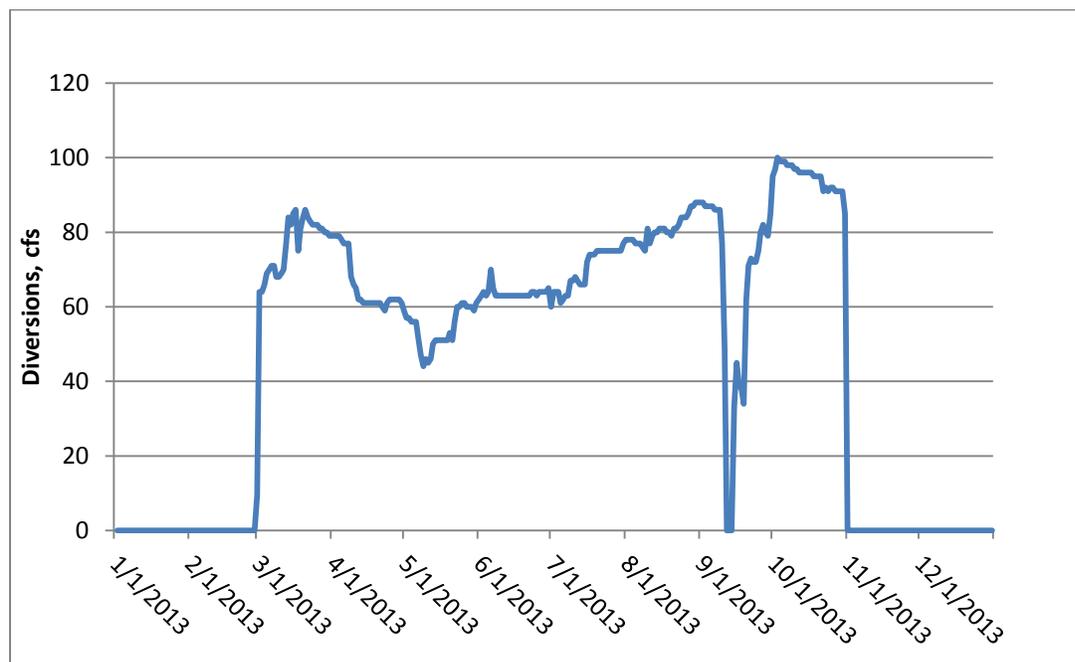


Figure 6: FSID Main Canal Diversion (data from USGS website 2/21/2013)

Fort Sumner Irrigation District Review of Operation and Maintenance

The Review of Operation and Maintenance (RO&M) examination of the FSID Diversion Dam was completed in June 2009. The next RO&M examination is scheduled for June 2015. All recommendations have been completed.

Other Pecos River Activities and Operations

Carlsbad Irrigation District Water Lease Program

Reclamation and the NMISC completed an Environmental Impact Statement in August 2006, clearing the way for a long term “Miscellaneous Purposes Contract,” which is required to allow Carlsbad Project Water to be released for delivery to the state line. Reclamation and CID entered into a 40 year contract on November 21, 2006, allowing Carlsbad Project water to be used for purposes other than irrigation. This contract provides for NMISC and CID to enter into third-party lease agreements for the purposes of leasing water from other CID water users. It also allows NMISC to use water appurtenant to lands it owns within the district for purposes other than irrigation. Such leases must be approved by Reclamation. No third-party agreements have been executed and approved to date. No water was leased during 2013.

Pecos River Settlement Implementation

The State of New Mexico, the Pecos Valley Artesian Conservancy District (PVACD), CID, and the United States Government signed the water rights Settlement Agreement (Settlement) on March 25, 2003. The Settlement and its implementation were vital to ensure delivery to Texas under the Pecos River Compact, to provide additional water supplies to CID, and to protect the Pecos Valley Artesian Conservancy District from a priority call on its junior groundwater rights. The Settlement provides additional water from two sources of water acquired by the New Mexico Interstate Stream Commission (NMISC): surface water from CID farmers and groundwater from PVACD farmers that is pumped from augmentation well fields operated by the NMISC.

Due to consecutive years of exceptional drought affecting the lower Pecos River Basin, CID’s 2013 water supply was at a historic low and the augmentation well fields could not pump enough water to meet the terms of the Settlement. Accordingly, CID asked for some assistance from the Settlement parties. Through a series of meetings, the parties agreed to pursue drought relief funding for CID from the New Mexico Legislature. That effort was unsuccessful, however, and the CID Board of Directors formally resolved to “call for administration of priorities on the Pecos River System with the State Engineer.” Fortunately, in September of 2013, a sizable summer monsoonal rain filled the reservoirs on the Pecos River, and the need for a priority call was at least temporarily averted. The Settlement parties are continuing discussions to seek alternative remedies to a formal priority call in the event of persistent drought-caused shortages for CID.

Pecos River Basin General Stream Adjudication

The Pecos River General Stream Adjudication² is ongoing in the fifth Judicial District Court in Chaves County, New Mexico. Reclamation and the U. S. Department of Justice are involved in this case by virtue of U. S. interest in the water rights for the Carlsbad Project. Adjudication of individual CID members' rights is ongoing.

WaterSMART

The Department of the Interior's WaterSMART initiative assists communities and irrigation districts in the western United States with funding to meet critical water related needs. The Department seeks to collaborate with local interests on projects that will help reduce the potential for water related conflicts. Under the WaterSMART program, Reclamation oversees WaterSMART, Title XVI Water Reclamation and Reuse Programs, Basin Study Programs, and the Cooperative Watershed Management Program. Recently closed funding opportunity announcements include Water Conservation Field Services Program Grants, Title XVI – Water Reclamation and Reuse, Advanced Water Treatment Grants, and Water and Energy Efficiency Grants. Additional information on the WaterSMART program are at <http://www.usbr.gov/WaterSMART/index.cfm>.

A memorandum of understanding between the New Mexico Interstate Stream Commission and Reclamation for a Pecos Basin Study was signed in October 2012. The Pecos River Basin in New Mexico and Texas is chronically water short, and is facing ever-increasing demands. This Basin Study proposes to develop better tools to help federal and state water managers improve administration of the limited water supplies in the Basin. Specifically, the proposal is to develop a numerical groundwater model for the Fort Sumner Underground Water Basin, within the Pecos River Basin in New Mexico. This portion of the Pecos River Basin is of critical importance in meeting the needs of both the 25,055 irrigated acres in the Carlsbad Project and the threatened shiner. Additionally, compliance with the water delivery requirements of the Pecos River Compact is essential. A robust groundwater model of the Fort Sumner Basin is an essential element in effective conjunctive management of groundwater and surface water.

CID was awarded a Water and Energy Efficiency Grant to replace Parshall flumes in irrigation channels that were inoperable due to settling or problems in original construction. Telemetry systems to transmit real-time data to the Irrigation District to manage system losses and measure water flows were installed. The project also includes GIS mapping and creation of a database for cataloging system information. All work is expected to be complete by April 2014.

² State of New Mexico, ex rel. the Office of the State Engineer and Pecos Valley Artesian Conservancy District v. L. T. Lewis, et al. and the United States of America, Case Nos. 20294 and 22600 (Consolidated)].

Pecos Sinkhole Study

Brine wells are mining operations that pump fresh water underground to dissolve salts in the soil. The brine that is produced is then pumped to the surface to be used elsewhere. This type of solution mining of the salt results in an underground cavern. The stability of the caverns is dependent upon their depth and width, and the strength of the materials above the void. Since July of 2008, three large sinkholes associated with brine wells in the Permian Basin have catastrophically developed. One of these possible holes potentially threatens an irrigation canal, the Carlsbad Main Canal.

A drilling and sonar investigation performed in 2010 failed to identify a cavern of sufficient volume to account for brine produced, based on well production records. The lateral extent of the cavern relative to the main canal was also not well defined. CID requested Reclamation investigate the risk posed by the sinkhole and propose mitigation options for the canal. In 2010, Reclamation reserved funding for an appraisal study. Reclamation has received data from field investigations by the City of Carlsbad and the New Mexico Energy, Minerals and Natural Resources Department's Oil Conservation Division, the agency with oversight of brine wells.

The sinkhole appraisal study was completed in early 2013, and proposes several alternatives to reroute this section of the Carlsbad Main Canal. The study was delivered to CID, who will decide how to move forward.

Quagga and Zebra Mussels

In January 2007, an employee with the National Park Service at Lake Mead, NV, discovered the first quagga mussel in the western United States. The mussels were likely transported to the west via a contaminated boat from an eastern state. Since that time, mussels have expanded their range throughout many western states. Since 2009, Reclamation has been sampling seven of its New Mexico reservoir bodies (Navajo, Heron, El Vado, Elephant Butte, Caballo, Sumner, and Brantley) for mussels and processing these water samples through Reclamation's research lab in Denver.

In October 2012, a mechanic doing work on a boat at Elephant Butte Reservoir discovered living mussels; these mussels were later identified as zebra mussels. The contaminated boat had been utilized multiple times at Elephant Butte Reservoir over a number of years. According to the owner, who had moved the boat from Michigan to New Mexico, the boat had not been utilized in any waters other than Elephant Butte since about 2007. Once this discovery was made, additional water testing for mussels at Elephant Butte was completed in November 2012. Results so far are negative.

Because Reclamation strongly believes that preventing the spread of mussels is the least costly option for protecting the state's water bodies, it is pursuing the following ongoing activities:

- Reclamation's Albuquerque Area Office has made a serious public outreach effort since 2009, printing some 41,000 'Zap the Zebra' brochures and 1,000 mussel posters. These brochures and posters that have been dispersed throughout New Mexico at the state parks, convenience and sporting good shops, libraries, etc.
- Permanent signs with the "Stop Aquatic Hitchhikers!" message have been installed at boating docks and other key park locations that are under Reclamation's jurisdiction.
- Reclamation purchased three mobile decontamination units; one is permanently assigned to Elephant Butte Reservoir, one is available for the Chama River area, and the third unit is in the Pecos River basin area. However, these units can be moved where needed.
- State and Federal employees continue to be trained to perform watercraft inspections (Level 1) and decontamination procedures (Level 2).

Seven mussel decontamination station locations have been designated at the following reservoir locations: Heron, El Vado, Elephant Butte Main Entry, Elephant Butte Hot Springs, Sumner, and two sites at Brantley. Funding and future direction shall determine if any of these facilities are built.

During 2013, the Bureau of Reclamation has continued to monitor its New Mexico reservoirs. No confirmed mussel detections were made during 2013 at these reservoir bodies. However, an unconfirmed PCR (Polymerase Chain Reaction, a technique to amplify a single or few copies of a piece of DNA to determine the species of origin) finding occurred from a sample taken at Navajo Reservoir's Simms Marina in July 2013. It is believed that the ongoing drought, along with fluctuating reservoir levels, may be affecting mussel establishment. Continued vigilance is important as conditions may change in the future. As recently as 2012, Reclamation detected three reservoirs in the State of New Mexico as "suspect" for having quagga mussels: Sumner, El Vado, and Navajo. As noted in 2012, further testing and confirmation is necessary before these waterways meet the State of New Mexico's criteria for being deemed "infested." Within the State of New Mexico, a body of water is deemed infested if it meets one of the following conditions:

- 1) Aquatic Invasive Species (AIS) is confirmed by positive PCR testing from two independent labs and at least one sample is confirmed positive by microscopy analysis; or
- 2) Confirmation of live adult AIS by two experts in the field of taxonomic identification of the taxa in question.

Without the presence of an organism (body), the positive DNA testing indicates an introduction or "inoculation," but not enough evidence to state that the water body has an established reproducing mussel population to call it infested.